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7
8 **UNITED STATES NUCLEAR REGULATORY COMMISSION**

9 **Before the Executive Director for Operations**

10 GREENACTION FOR HEALTH AND
11 ENVIRONMENTAL JUSTICE,

12 Petitioner,

13 v.

14 TETRA TECH EC, INC.,

15 Respondent.
16

**Tetra Tech EC, Inc.'s Response to
10 CFR § 2.206 Petition to Revoke
Materials License No. 29-31396-01**

17 Tetra Tech EC, Inc. ("TtEC") respectfully submits this Response to the Petition of
18 Greenaction for Health and Environmental Justice ("Petitioner"), which seeks to revoke
19 the NRC materials license of TtEC (License No. 29-31396-01) based on allegations
20 related to TtEC's work at the Hunters Point Naval Shipyard ("HPNS" or "the Site") in San
21 Francisco, California.

22 The Petition does not meet the criteria for acceptance by the Petition Review
23 Board ("PRB") under 10 C.F.R. § 2.206. Specifically, the Petition should be rejected
24 because (1) it is based on alleged misconduct that did not occur under TtEC's Nuclear
25 Regulatory Commission ("NRC") materials license; (2) Petitioner has not presented
26 "significant new information," as is required to reopen the NRC's completed and closed
27 investigation of TtEC; and (3) Petitioner's allegations are either demonstrably false or so
28 implausible as to lack any credibility whatsoever.

1 The Petition is both procedurally flawed and substantively inaccurate. It is based
2 on false allegations that are part of a broader scheme concocted by Petitioner and its
3 legal counsel, including an attorney who has been disciplined multiple times by the
4 California State Bar for fabricating evidence. Petitioner's counsel has recruited declarants
5 who are willing to lie under oath with the expectation of receiving a financial benefit if the
6 government files an action against TtEC for making false claims. The NRC should not
7 allow the integrity of its licensing process to be tarnished by the perjured statements
8 submitted in support of the Petition.

9 The NRC has already completed a comprehensive investigation of data issues
10 identified at the Site by the Navy and TtEC. Those issues were thoroughly investigated
11 by TtEC, in close consultation with the Navy and the NRC. The investigation and results
12 were documented in a report issued by TtEC (the "Investigation Conclusion Anomalous
13 Soil Samples at Hunters Point Naval Shipyard" report, April 2014). Both the Navy and the
14 NRC reviewed the report, and the Navy accepted the report's conclusions.

15 The NRC has also conducted two independent investigations into the allegations
16 against TtEC, from 2011 to 2013 and again in 2014. This included investigating the data
17 irregularities identified by the Navy, and a broader investigation into allegations made by
18 former employees and subcontractors. The NRC filed and resolved an enforcement
19 action against TtEC that addressed the discrete, localized data irregularities identified in
20 the TtEC/Navy investigation, and found all other allegations of misconduct to be
21 unsubstantiated. Any further investigation by the NRC, triggered solely by Petitioner's
22 and declarants' willingness to lie to the NRC for financial gain, is not necessary or
23 warranted under 10 C.F.R. § 2.206. Therefore, the PRB should reject the Petition.

24 **I. BACKGROUND**

25 **A. HPNS Historical Use and Superfund Designation**

26 HPNS is a former Naval shipyard located in southeast San Francisco, California.
27 HPNS functioned as a Navy-run repair facility from 1939 to 1974, with private companies
28

1 operating at the Site prior to and following its use as a Naval base.¹ The shipyard was
2 used for radiological operations beginning in 1946, which included the repair, use, and
3 disposal of radioluminescent items, gamma radiography for testing, radiological research
4 and laboratory operations, decontamination and scientific research during atomic
5 weapons testing, and additional use of radionuclides for scientific research by the Naval
6 Radiological Defense Laboratory.² Numerous radiological investigations, surveys, and
7 studies have been conducted at the Site.³

8 Shipyard operations were permanently terminated following the Navy's decision in
9 1998 to add HPNS to its Base Realignment and Closure ("BRAC") Program for cleanup
10 and transfer of the military installation for redevelopment.⁴ In 1989, the U.S.
11 Environmental Protection Agency ("EPA") evaluated and placed HPNS on the Superfund
12 National Priorities List in response to concerns about hazardous and radiological wastes
13 created by historical activities at the Site.⁵ The Navy is the lead agency responsible for
14 investigation and cleanup, while the EPA is the lead regulatory agency providing federal
15 oversight.⁶ To manage cleanup of the 934-acre HPNS Site, the Site was divided into
16 thirteen parcels.⁷ Parcel A was transferred to the San Francisco Office of Community
17 Investment and Infrastructure (formerly the San Francisco Redevelopment Agency) in

18 _____
19 ¹ See NAVSEA, Hunters Point Shipyard Final Historical Radiological Assessment History
20 of Use of General Radioactive Materials 1939-2003 (2004), at Section 6.0, available at
https://bracpmo.navy.mil/content/dam/bracpmo/california/former_naval_shipyard_hunters_point/pdfs/all_documents/environmental_documents/radiological/hps_200408_hra.pdf.

21 ² See *id.*

22 ³ *Id.*

23 ⁴ EPA, Hunters Point Naval Shipyard Annual Update of Cleanup Achievements, SEMS-
24 RM DOC ID #100005400 (2017), at p. 1, available at <https://semspub.epa.gov/work/09/100005400.pdf> ("EPA, 2017 Annual Update").

25 ⁵ EPA, 2017 Annual Update at p. 1.

26 ⁶ EPA, Treasure Island Naval Station–Hunters Point Annex San Francisco, CA
27 Background, available at <https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0902722#bkgground>.

28 ⁷ EPA, 2017 Annual Update at p. 3.

1 2004, and Parcels D-2, UC-1, and UC-2 were transferred to the City in 2015; cleanup
2 activities on the remaining nine parcels are ongoing.⁸

3 **B. TtEC's Engagement and Work at HPNS**

4 TtEC was first awarded a contract to perform work for the Navy at HPNS in 2002,
5 and had a continuous presence at HPNS through 2016 for both non-radiological studies
6 and radiological tasks. TtEC was involved in three major categories of radiological tasks
7 at HPNS: (1) removal of Navy contaminated sanitary sewers and storm drains, (2)
8 surveys of impacted buildings and former building sites, and (3) radiological support
9 activities.

10 The Navy initially directed TtEC to hire a small business subcontractor to complete
11 the radiological work and identified New World Environmental ("NWE"), dba New World
12 Technology, as the sole radiological subcontractor able to complete the necessary work.⁹
13 NWE was already present and working at the Site prior to the time that TtEC was
14 awarded its first radiological contract in 2003. From that point until March 30, 2009, all
15 radiological work at HPNS was completed under only NWE's license. Unfortunately,
16 TtEC's reliance on NWE created unclear lines of authority at the Site, leading to quality
17 control and morale issues. To address these issues, TtEC developed a new management
18 plan for HPNS in 2006, under which TtEC placed senior managers onsite at HPNS full
19 time, hired radiological supervisors to manage the fieldwork, and developed a
20 comprehensive data management system and standard operating procedures.

21 In early 2009, to resolve ongoing issues with NWE's performance, TtEC, with the
22 support of the Navy, invoked its own NRC materials license at the Site. TtEC's license
23
24

25 ⁸ *Id.*

26 ⁹ See Memorandum from Laurie Lowman, Director, Radiation Support and Navy Low-
27 Level Radioactive Waste, Naval Sea Systems Command Detachment, Radiological
28 Affairs Support Office, Qualification of Radiological Subcontractor at HPNS (Jan. 23,
2007), attached as Exhibit 1.

1 was invoked on March 30, 2009.¹⁰ Based on the Navy Radiological Affairs Support
2 Office's ("RASO") input, TtEC hired experienced NWE supervisors and workers, including
3 Petitioner's Declarant Elbert Bowers, to maintain continuity at HPNS.

4 All of TtEC's work was performed to ensure public safety, and was conducted with
5 the nearly continuous presence of state, local, and federal regulatory agencies. In
6 particular, the Navy RASO was a daily presence at the Site. The work that TtEC
7 performed was extensive. TtEC removed 24 miles of sewer and storm drains and 32,853
8 cubic yards of asphalt and concrete, screened 270,000 cubic yards of excavated soil, and
9 conducted thousands of surveys. All of this work was closely overseen and approved by
10 the Navy, in addition to regular review by state and federal regulatory agencies.

11 C. NRC Former Employee Investigations

12 Petitioner relies on the declarations of former NWE and TtEC employees in
13 support of its request to reopen the NRC's prior investigation regarding the Site. These
14 declarations include statements from Elbert Bowers, Archie Jackson, Arthur Jahr, and
15 Susan Andrews, all of whom made prior complaints to the NRC in which they alleged
16 they were harassed, discriminated against, or terminated for raising safety concerns at
17 HPNS. As described below, the NRC investigated each of these claims and was unable
18 to corroborate them.¹¹

19 In or about August 2010, TtEC was informed that Arthur Jahr, an NWE employee,
20 had made inappropriate comments while working at HPNS. NWE investigated and
21 confirmed the claims, at which point TtEC requested that Jahr be removed from the Site.
22 Jahr subsequently filed a complaint with the NRC alleging that he was subjected to
23 harassment and discrimination for raising safety concerns. The NRC determined that

24

25 ¹⁰ See Letter from Tetra Tech EC, Inc. to U.S. Regulatory Commission, Region IV,
26 Notification of License Use at Hunter Point Shipyard (Mar. 13, 2009), attached as Exhibit
27 2.

28 ¹¹ See *generally*, Letters from NRC to TtEC regarding these investigations, attached at
Exhibit 3.

1 there was insufficient evidence to support Jahr's claims.¹²

2 In or about January 2011, Elbert Bowers, then a TtEC employee (following his
3 employment with NWE), was involved in a dispute with three Radiation Technician
4 Supervisors, as well as with Bill Dougherty, TtEC's onsite Project Manager. Because of
5 Bowers' inappropriate behavior toward the Radiation Technician Supervisors, who
6 reported to him, TtEC management moved Bowers off HPNS to another TtEC project
7 site. He then alleged discrimination, and later in 2011, the NRC began an investigation to
8 determine whether Bowers had been discriminated against by TtEC for raising safety
9 concerns. The investigation continued for over a year, and closed on or about May 29,
10 2013. The NRC was unable to substantiate Bowers' claims.¹³

11 In December 2011, the Navy revised the scope of work for base wide support at
12 HPNS, which required a staff reduction of two Radiation Control Technicians. Andrews
13 and Jackson were selected for reduction and did not return to the project. Both Andrews
14 and Jackson later filed complaints with the NRC, each alleging that they were wrongfully
15 terminated for raising safety concerns at the Site. The NRC Investigated and was unable
16 to validate Jackson's and Andrews' allegations.¹⁴

17 **D. 2012 TtEC Investigation of Soil Sampling Issues**

18 In October 2012, during a routine conference call, a Navy official at RASO
19 expressed concerns about certain TtEC sampling data.¹⁵ Final systemic samples at one
20 location (Building 517) appeared to report lower than expected Potassium-40 levels.¹⁶

22 ¹² See Letter from NRC to Albert Perry, NRC Office of Investigations Case No. 1-2012-
23 032 (July 8, 2013) at p.1, attached at Exhibit 3.

24 ¹³ See Letter from NRC to Albert Perry, NRC Office of Investigations Case No. 1-2012-
002 (May 29, 2013), at p.1, attached at Exhibit 3.

25 ¹⁴ See Letter from NRC to Albert Perry, NRC Office of Investigations Case Nos. 1-2012-
26 019 and 1-2012-037 (Dec. 6, 2013) at p. 1, attached at Exhibit 3.

27 ¹⁵ See TtEC, Investigation Conclusion Anomalous Soil Samples at Hunters Point Naval
Shipyard (Apr. 2014), Petition Exhibit H at ES-1, 1.

28 ¹⁶ *Id.*

1 TtEC conducted an extensive investigation and identified a number of corrective actions,
2 summarized in the TtEC "Investigation Conclusion Anomalous Soil Samples at Hunters
3 Point Naval Shipyard" report, the first draft of which was submitted to the Navy on
4 November 29, 2012, and to the NRC on December 3, 2012. After extensive discussions
5 with the Navy and responding to multiple rounds of its comments, TtEC finalized the
6 report in April 2014.¹⁷

7 To determine what happened, TtEC investigators conducted additional sampling at
8 identified locations, performed a database review of over 70,000 sampling results
9 reported since 2008, and conducted in-person interviews with individuals identified on the
10 chain-of-custody ("COC") forms, as well as direct supervisors, members of sampling
11 crews, and lab workers.¹⁸ During the investigation, and despite repeated questioning, no
12 individuals admitted to any improper sampling, resulting in an inconclusive determination
13 as to exactly what had occurred with the samples. However, investigators determined the
14 likely cause was that individuals identified as the sample collectors on certain COCs had
15 not collected soil from the COC-identified locations.¹⁹ The evidence indicated that
16 samples from twelve survey units were potentially not representative of the identified
17 locations and seven additional units were determined to be of potential concern.²⁰

18 To ensure that all remediation was completed as required, TtEC resampled all
19 twelve survey units, as well as four of the additional seven units where potential issues
20 were identified, and then conducted remediation and re-sampling in those areas as
21 necessary.²¹ The three remaining potentially suspect areas were not resampled because
22 the uniform results were determined to be a result of naturally occurring soil

24 ¹⁷ *Id.*

25 ¹⁸ *Id.* at ES-1 to ES-2, 4-18.

26 ¹⁹ *Id.* at ES-2, 18-19.

27 ²⁰ *Id.* at ES-1.

28 ²¹ *Id.* at ES-3, ES-5.

1 homogeneity, and not the result of potential data manipulation.²²

2 TtEC took further actions to ensure the accuracy of future sampling and instituted
3 procedures to immediately identify and escalate any sampling issues. These procedures
4 included refresher training on sampling and filling out COC forms, training on ethical
5 behavior, quality control surveillance, and notification of the corporate Radiation Safety
6 Officer ("RSO") whenever samples were inconsistent with prior results.²³

7 The Radiation Control Technicians associated with the irregular samples at the
8 Site were permanently removed from TtEC projects following the investigation.²⁴ In
9 addition, the two Radiation Task Supervisors overseeing the work were suspended
10 without pay for 30 days and placed on a one-year probation. Five years later in 2017,
11 those two individuals, Justin Hubbard and Steven Rolfe, admitted to the U.S. Department
12 of Justice that they switched certain soil samples at issue in the investigation so that
13 "clean" soil was analyzed rather than soil from the COC-identified sampling location.
14 Hubbard and Rolfe were prosecuted and sentenced to prison. TtEC fully supports the
15 Government's actions in those cases.

16 No TtEC managers were indicted for having any knowledge of, or involvement in,
17 Hubbard's or Rolfe's activities. Further, the NRC fully investigated the soil sampling
18 incident (as discussed further below) and concluded that TtEC management was not
19 involved in the misconduct.²⁵ The outcome of the NRC investigation and the apparent
20 result of the Department of Justice's criminal investigation are consistent with the
21 conclusion of TtEC's and the Navy's investigation of the data issues identified in 2012:
22 isolated instances of misconduct by low-level employees had taken place. TtEC
23 investigated and resampled the affected areas and implemented procedures to prevent
24

25 ²² *Id.* at ES-2.

26 ²³ *Id.*

27 ²⁴ *Id.*

28 ²⁵ See Petition, Exhibit J, Encl. 1 at p. 2, NRC Response to Point #3.

1 the recurrence of such misconduct.

2 **E. 2014 NRC Investigation of Soil Sampling Issues**

3 In June 2014, the NRC notified TtEC that it too was investigating the soil sampling
4 issues identified in TtEC's April 2014 report. The NRC's investigation began on or about
5 April 29, 2014, and lasted over a year.²⁶ The NRC took sworn statements from TtEC
6 HPNS managers, including Dennis McWade and Bill Dougherty, as well as numerous
7 Radiation Control Technicians and Radiation Task Supervisors involved in soil sampling
8 and remediation activities at the Site.

9 The NRC investigation covered the same time period as the TtEC and Navy
10 investigations of soil sampling issues at the Site. During the course of the NRC
11 investigation, it was revealed that a Radiation Control Technician and a Radiation Task
12 Supervisor deliberately falsified soil samples by gathering samples from an area other
13 than where the samples were identified as having originated.²⁷ The NRC determined that
14 both individuals were acting outside of established TtEC protocols.²⁸ The NRC further
15 concluded that TtEC management was not involved in any of the data falsification.²⁹
16 Despite the breadth of the NRC's investigation, the NRC did not identify any further
17 sampling issues, and the NRC's conclusions were consistent with the results of TtEC's
18 and the Navy's investigations.

19 **F. Petitioner Makes False and Implausible Allegations of Widespread
20 Fraud at HPNS**

21 Petitioner is a community organization with an anti-development agenda. It
22 disagrees with the City of San Francisco's decision to support the development of
23 thousands of units of sorely needed housing at the HPNS site. Petitioner's goals for the

24 _____

25 ²⁶ See Letter from NRC to Andrew Bolt, NRC Office of Investigations Report No. 1-2014-
26 018 (Feb. 11, 2016), Petition Exhibit I at p.1 (noting that the NRC investigation began
April 29, 2014 and was completed September 15, 2015).

27 ²⁷ *Id.* at Encl. 1, p. 1.

28 ²⁸ *Id.*

29 ²⁹ See Petition, Exhibit J, Encl. 1 at p. 2, NRC Response to Point #3.

1 Site are ill-defined; the main purpose of its campaign appears to be to generate political
2 and financial support by opposing development, without offering plausible alternatives for
3 the reuse of a large plot of vacant land in a densely populated urban area with the
4 highest housing costs in the nation.

5 To advance this agenda, Petitioner has joined forces with attorney David Anton to
6 suborn perjury. As discussed in detail below, the declarations of the former NWE and
7 TtEC employees submitted in support of the Petition are rife with statements that are
8 demonstrably false, or so implausible that anyone with even a passing familiarity with the
9 investigation and remediation of contaminated property would know they are not true.

10 Anton and Petitioner's other attorneys—who clearly drafted these false
11 statements—are apparently not familiar with environmental site cleanup. Anton, however,
12 is familiar with falsifying evidence. Anton has been suspended twice by the California
13 State Bar, and one of those suspensions is based on his admission that he "fabricated
14 evidence" in a wrongful termination case filed in federal court.³⁰ He has done so again
15 here, encouraging Declarants to perjure themselves to advance Petitioner's interests—as
16 well as their own, as the Declarants have a financial stake in potential claims against
17 TtEC.

18 As discussed below, Declarants' false allegations do not provide a credible basis
19 for reopening the NRC's closed investigation of TtEC's work at HPNS. The NRC should
20 disregard Petitioner's false allegations, and should reject the Petition because it is
21 improper under 10 C.F.R. § 2.206.

22 **II. LEGAL STANDARD**

23 The Petition is brought pursuant to 10 C.F.R. § 2.206, which provides that "[a]ny
24 person may file a request to institute a proceeding pursuant to [10 C.F.R.] § 2.202 to
25 modify, suspend, or revoke a license, or for any other action as may be proper." NRC
26 Management Directive 8.11 ("MD 8.11") governs the NRC's internal review process for

27 _____
28 ³⁰ See Attorney Licensee Profile, David C. Anton, State Bar No. 94852, available at
<http://members.calbar.ca.gov/fal/Licensee/Detail/94852>.

1 10 C.F.R. § 2.206 petitions. Petitions must meet certain criteria in order to be accepted
2 by the NRC and considered under § 2.206, including:

- 3 ▪ the petition must contain a "request for enforcement related action;"
- 4 ▪ the facts that constitute the bases for taking the particular action must be
5 specified, supported "beyond the bare assertion," and be "credible and sufficient to
6 warrant further inquiry;" and
- 7 ▪ there must be no available NRC proceeding "in which the petitioner is, or could be,
8 a party and through which the petitioner's concerns could be addressed."³¹

9 Additionally, the M.D. 8.11 specifies criteria for rejecting petitions. These criteria are:

- 10 ▪ the "correspondence does not ask for an enforcement-related action," or "fails to
11 provide sufficient facts to support the petition;"
- 12 ▪ the "petitioner raises issues that have already been the subject of NRC staff
13 review and evaluation ... for which a resolution has been achieved, the issues
14 have been resolved, and the resolution is applicable to the facility in question;"
- 15 ▪ the "request is to deny a license application or amendment;" and
- 16 ▪ the "request addresses deficiencies within existing NRC rules."³²

17 The PRB is tasked with determining whether a petitioner's request meets the criteria for
18 review as outlined above.³³ The PRB then makes a recommendation to the appropriate
19 Director as to whether to accept or reject the petition.³⁴

20 **III. THE PETITION IS BASED PRIMARILY ON ALLEGATIONS THAT ARE**
21 **UNRELATED TO TTEC'S MATERIALS LICENSE.**

22 Until March 30, 2009, TtEC subcontractor NWE, dba New World Technology, held
23 the NRC license for work performed at HPNS. NWE was employed as a subcontractor at
24

25 ³¹ MD 8.11 Part III(C)(1)(a) at p.11.

26 ³² *Id.*, Part III(C)(2) at p.12.

27 ³³ *Id.*, Part III(D) at p.13.

28 ³⁴ *Id.*, Part III(G) at p.15-16.

1 the Site at the direction of the Navy.³⁵ TtEC's license was invoked on March 30, 2009.³⁶

2 The allegations in the Petition rely in large part, and in some cases entirely, on
3 alleged misconduct that took place prior to March 30, 2009, under NWE's NRC license.

4 For example:

- 5 ▪ Petitioner alleges that "sometime in early 2006 . . . Joe Levell . . . substantially
6 increased" the speed at which a conveyor belt for scanning potentially
7 contaminated soil operated.³⁷ The conveyor speed issue is mentioned throughout
8 the declarations in support of the Petition, but all of these allegations fall outside
9 the time period that TtEC's license was in effect. In fact, TtEC and NWE identified
10 and corrected a scan speed issue in 2006, and took all necessary precautions to
11 ensure that all affected soil was rescanned as necessary.³⁸
- 12 ▪ Petitioner alleges that inadequate remediation was conducted in Building 351A in

15 ³⁵ See Memorandum from Laurie Lowman, Director, Radiation Support and Navy Low-
16 Level Radioactive Waste, Naval Sea Systems Command Detachment, Radiological
17 Affairs Support Office (RASO), Qualification of Radiological Subcontractor at HPNS,
(Jan. 23, 2007), attached as Exhibit 1.

18 ³⁶ See Letter from Tech EC, Inc. to U.S. Regulatory Commission, Region IV, Notification
of License Use at Hunter Point Shipyard (Mar. 13, 2009), attached as Exhibit 2.

19 ³⁷ Petition at p. 24, ln. 3-4.

20 ³⁸ During the week of May 29, 2006, a contaminated button was identified at the portal
21 monitor. The portal monitor ensured the adequacy of soil scanning processes by
22 checking truckloads of soil departing HPNS. TtEC and NWE quality control and
23 radiological staff conducted an investigation to determine how the button was missed
24 during scanning. The investigation consisted of field inspections, reviewing compliance
25 with procedures, contacting the conveyor vendor and maintenance providers, and
26 interviewing over twenty-four TtEC and NWE staff at the relevant scanning sites. The
27 investigation determined that the scan speeds were likely altered during a partial
28 disassembly and reassembly of the conveyor during a winter shutdown. The investigation
identified other potential causes of inadequate scanning, including a lack of consistent
staff training. In response, TtEC and NWE adjusted procedures to ensure compliance.
Affected soil was rescanned, twice daily checks of conveyor belt speed were instituted as
well as routine quality control checks, additional staff refresher training was provided, and
procedures were adjusted to ensure the effectiveness of the soil scanning process. The
Navy was notified, oversaw, and approved TtEC's response.

1 2008 and 2009.³⁹ Building 351A remediation was complete in January 2009,⁴⁰
2 before TtEC's license was invoked on March 30, 2009.

- 3 ■ Allegations regarding Jane Taylor's purportedly questionable resume and
4 subsequent hiring by NWE occurred in 2006.⁴¹ TtEC was not involved in NWE's
5 hiring decisions.
- 6 ■ All of the allegations contained in Richard Stoney's declaration occurred prior to
7 Stoney's resignation on May 28, 2006.⁴²
- 8 ■ The allegations in Robert McLean's declaration all relate to his work for NWE at
9 HPNS until the fall of 2006, when he was transferred offsite.⁴³

10 Because the Petition seeks to revoke TtEC's license, the NRC's review should be
11 confined to those allegations that occurred on or after March 30, 2009, during the use of
12 TtEC's license at HPNS.

13 **IV. PETITIONER HAS NOT PRESENTED "SIGNIFICANT NEW INFORMATION" TO**
14 **THE NRC.**

15 The NRC must reject a petition under 10 C.F.R. § 2.206 if the petitioner "raises
16 issues that have already been the subject of NRC staff review and evaluation."⁴⁴
17 Requests for NRC action "will not be treated as a 2.206 petition unless they present
18 significant new information."⁴⁵ Petitioner's allegations are little more than a rehashing and
19 repackaging of allegations that were the subject of the NRC's prior investigation of TtEC
20 and do not meet this threshold criteria for acceptance of the Petition.

21

22 ³⁹ See Petition at p. 14, ln.19 to p.16, ln. 10.

23 ⁴⁰ See Portions of Building 351A Logbook, attached as Exhibit 4.

24 ⁴¹ See Petition at p. 26, ln. 12 to p.27 ln. 3.

25 ⁴² See Declaration of Richard Stoney, Petition Exhibit G at ¶ 3.

26 ⁴³ See Declaration of Robert Mclean, Petition Exhibit N at ¶ 3.

26 ⁴⁴ 10 C.F.R. § 2.206.

27 ⁴⁵ NRC, Management Directive 8.11: Review Process for 10 CFR 2.206 Petitions (Jul. 1,
28 1999, revised Oct. 25, 2000), Part III(C)(2)(b) ("MD 8.11").

1 **A. The NRC has already completed its investigation of the sampling**
2 **issues alleged in the Petition.**

3 NRC's investigation into sampling issues at the HPNS Site, which began in 2014,
4 was extensive. The investigation took over a year and involved numerous interviews of
5 HPNS staff.⁴⁶ The investigation identified that a Radiation Control Technician and a
6 Radiation Task Supervisor had falsified soil samples and completed inaccurate COC
7 forms.⁴⁷ These are the same substantive allegations regarding fraudulent sampling that
8 appear in the Petition.

9 The NRC investigation confirmed that any suspect data at the Site was limited to
10 the conduct of one Radiation Control Technician and one Radiation Task Supervisor who
11 falsified soil samples and one Radiation Task Supervisor who falsified chain-of-custody
12 forms. The investigators found no evidence that TtEC managers participated in or
13 directed this unlawful conduct.

14 On October 11, 2016, the NRC issued a Confirmatory Order that identified a single
15 violation of TtEC's license conditions that occurred sometime between November 11,
16 2011, and June 4, 2012, and noted that "TtEC remains in good standing with respect to
17 the terms and conditions of its NRC license."⁴⁸ The NRC therefore agreed to waive
18 imposition of civil penalty, and TtEC in turn agreed to conduct safety and worker
19 awareness training for employees engaged in licensed activities, among other
20 conditions.⁴⁹

21 Petitioner had the opportunity to object to the Confirmatory Order and request a
22
23

24 ⁴⁶ See Letter from NRC to Andrew Bolt, NRC Office of Investigations Report No. 1-2014-
25 018 (Feb. 11, 2016), Petition Exhibit I at p.1 (noting that the NRC investigation began
April 29, 2014 and was completed September 15, 2015).

26 ⁴⁷ See Confirmatory Order, 81 Fed. Reg. 73144 (Oct 24, 2016), Petition Exhibit K at p.3.

27 ⁴⁸ *Id.* at 1.

28 ⁴⁹ *Id.* at 3-7.

1 hearing within 30 days of the Order's issuance.⁵⁰ But rather than intervene in the process
2 at the appropriate time, Petitioner waited eight months to file this Petition and request that
3 the NRC reopen a completed and properly closed investigation.⁵¹ Petitioner gives no
4 explanation as to why it was unable to file a timely request for intervention. Petitioner's
5 disregard of other available procedural mechanisms to raise the untimely arguments it
6 now attempts to make provides further justification for NRC's rejection of the Petition.⁵²

7 Indeed, Petitioner acknowledges that the NRC has already investigated the
8 allegations in the Petition, but nonetheless claims that the investigation was "inadequate"
9 because Petitioner disagrees with the methodology and conclusions of the NRC's
10 investigation.⁵³ In support of this assertion, Petitioner cites the declarations of Elbert
11 Bowers, Susan Andrews, and Archie Jackson.⁵⁴ However, the Declarants' statements do
12 not support Petitioner's claims. The cited portion of Bowers' declaration alleges only that
13 Bowers "became aware" *after he left HPNS* that there was a violation of soil sampling
14 procedures. Jackson's and Andrews' declarations state that they felt the NRC did not
15 adequately address their concerns, but there is nothing to substantiate this assertion.⁵⁵
16 Moreover, Bowers left the site in January 2011, before any sampling issues were
17 identified or believed to have occurred.⁵⁶ And neither Andrews nor Jackson were involved
18 with cleanup at specific locations, nor were they part of the sample collection teams. In

19 _____
20 ⁵⁰ 10 C.F.R. §§ 2.202, 2.309.

21 ⁵¹ See Petition at p. 40, ln. 9-11.

22 ⁵² See MD 8.11 Part III(C)(iii) (NRC staff will review a petition if it meets specified criteria
23 including, "[t]here is no proceeding available in which the petitioner is or could be a party
and through which the petitioner's concerns could be addressed").

24 ⁵³ See Petition at p.3, ln. 10-14.

25 ⁵⁴ *Id.* at p.3 n.7.

26 ⁵⁵ See Declaration of Susan Andrews ("Andrews Decl.") at ¶¶ 56-59; Declaration of
Archie Jackson ("Jackson Decl.") at ¶ 21.

27 ⁵⁶ See Confirmatory Order, 81 Fed. Reg. 73144 (Oct 24, 2016), Petition Exhibit K at p.1
28 (noting that a single violation of TtEC's license conditions occurred sometime between
November 11, 2011 and June 4, 2012).

1 truth, the NRC performed multiple investigations that addressed the allegations made
2 regarding TtEC's work at the Site, primarily by the same former employees whose
3 declarations now support the Petition.

4 **1. The NRC investigated Elbert Bowers' allegations, beginning in**
5 **2011, and found insufficient evidence to substantiate his claims.**

6 Following a complaint filed by Bowers, the NRC initiated an investigation into
7 whether Bowers was discriminated against for raising safety concerns.⁵⁷ Bowers alleged
8 that TtEC management removed him from HPNS because he was strictly enforcing
9 safety rules at the Site—the same allegations contained in his declaration in support of the
10 Petition.⁵⁸ However, the NRC found insufficient evidence to substantiate Bowers'
11 claims.⁵⁹

12 The limited issues that Bowers claims to have personal knowledge of do not justify
13 a new investigation, much less revocation of TtEC's license. Bowers repeatedly asserts
14 that *he was unaware of any fraud at the Site*, and has no personal knowledge of any
15 purported fraud concerning sampling, COC forms, or building scans.⁶⁰ Bowers alleges
16 only that he has "since been informed" that there was an alert system in place to prevent
17 his knowledge of any "obvious cheating."⁶¹ However, neither Bowers nor any other
18 Declarant has explained how this system operated or what exactly it was designed to
19 prevent Bowers from witnessing. Bowers is merely speculating as to alleged conduct—an
20 "alert system"—of which he has no first-hand knowledge or credible evidence.

21 Bowers also states that he caught and corrected a number of health and safety
22 issues at the Site, which is precisely what he was hired to do. For example, Bowers
23 _____

24 ⁵⁷ See Letter from NRC to Albert Perry, NRC Office of Investigations Case No. 1-2012-
002 (May 29, 2013) at p.1, attached at Exhibit 3.

25 ⁵⁸ See *generally* Declaration of Bert Bowers ("Bowers Decl.") at ¶¶ 7, 10, 15.

26 ⁵⁹ *Id.*

27 ⁶⁰ See *e.g.*, Bowers Decl. at ¶¶ 6, 12, 13, 21, 24, 74-78.

28 ⁶¹ *Id.* at ¶ 9.

1 identifies a number of instances in which he found unsecured areas or improper
2 controlled area postings.⁶² The fact that Bowers was doing his job to identify and correct
3 these relatively routine issues does not warrant further NRC investigation. Nowhere in
4 Bowers' declaration does he state that he made any complaint to the NRC, prior to
5 leaving TtEC, about safety concerns he had at the Site. Nor does he indicate he brought
6 any concerns about safety issues to the attention of TtEC management. There is no
7 substance to Bowers' allegations, and the PRB should disregard them.

8 **2. The NRC investigated the allegations made by Susan Andrews,**
9 **Archie Jackson, and Arthur Jahr, beginning in 2012, and found**
10 **insufficient evidence to substantiate their claims.**

11 Susan Andrews' 2012 NRC complaint identified the same issues as those that
12 allegedly support the Petition: unqualified and/or untrained workers, falsification of COC
13 forms, inadequate employee training and/or certification, a culture where production took
14 precedence over safety, inaccurate data input, incorrect instrument calibration, failure to
15 follow procedures for frisking when entering or exiting an identified contaminated area,
16 and failure to follow procedures when eating or drinking in a posted contaminated area.⁶³

17 Based on discussions TtEC had with the NRC during the course of the
18 investigations, TtEC is aware that the concerns raised by Archie Jackson and Arthur Jahr
19 were substantially identical to those raised by Andrews in 2012.⁶⁴ In each case, the NRC
20 found there was insufficient evidence to substantiate the claims made by these
21 individuals. The Andrews, Jackson, and Jahr declarations repeat the same allegations
22 that the NRC investigated and found to be without merit. Thus, the NRC's prior, thorough
23 investigation of these allegations requires the NRC to reject the Petition.

24
25
26 ⁶² *Id.* at ¶¶ 56-59.

27 ⁶³ See Letter from NRC to Susan Andrews (Jan. 5, 2012), attached at Exhibit 3.

28 ⁶⁴ See Letter from NRC to Albert Perry, NRC Office of Investigations Case Nos. 1-2012-
019 and 1-2012-037 (Dec. 6, 2013); Letter from NRC to Albert Perry, NRC Office of
Investigations Case No. 1-2012-032 (Jul. 8, 2013), attached at Exhibit 3.

1 **3. Anthony Smith's allegations are substantially similar to those**
2 **alleged by the other Declarants, all of which were thoroughly**
3 **investigated by the NRC.**

4 While Anthony Smith did not previously file a complaint with the NRC, his
5 allegations are essentially identical to those investigated by the NRC, which requires the
6 NRC to deny the Petition. Smith alleges that he witnessed untrained or unqualified
7 workers at HPNS, falsification of soil sampling, falsification of chain of custody
8 documentation, fraudulent building surveys conducted, and data manipulation at the
9 Site.⁶⁵ The NRC's investigation considered similar allegations made by the other
10 Declarants, as explained above. Smith's allegations add nothing new, and certainly not
11 "significant new information" that would justify acceptance of the Petition.

12 Smith's allegations are also unsubstantiated, and in many instances verifiably
13 false, as discussed in Section V. A., below. The NRC should not reopen its investigation
14 based on Smith's claims, because they do not present significant, new, credible
15 information, as is required for acceptance of the Petition under 10 C.F.R. § 2.206.

16 **4. The NRC has already investigated the Declarants' allegations of**
17 **unqualified and untrained employees at HPNS.**

18 In addition to the allegations discussed above, Petitioners make allegations about
19 the qualifications and conduct of Health Physics Specialist Jane Taylor and Radiological
20 Data Analyst Thorpe Miller.⁶⁶ TtEC understands that the NRC investigated these claims
21 (in Case Nos. 1-2012-002, 1-2012-019, 1-2012-032, and 1-2012-037) based upon
22 multiple conversations and inquiries from the NRC related to these allegations. The NRC
23 took no enforcement action against TtEC in response to these claims.⁶⁷

24 The reasons for the NRC's inaction are apparent from the flimsiness of Petitioner's

25 ⁶⁵ See Declaration of Anthony Smith ("Smith Decl.") at ¶¶ 4, 7.

26 ⁶⁶ See Petition at p. 26, ln. 7 to p.28, ln. 17.

27 ⁶⁷ See Letters from NRC to Albert Perry, NRC Office of Investigations Case Nos. 1-2012-
28 002 (May 29, 2013); 1-2012-032 (July 8, 2013); and 1-2012-019 and 1-2012-037 (Dec. 6,
2013), attached at Exhibit 3.

1 current allegations. Petitioner's assertion that Taylor and Miller "saw to it that the large
2 majority of soil excavated from the sewer trenches was not treated as radioactively
3 contaminated soil" is based on a single example of an area where a low percentage of
4 contaminated soil was identified and removed.⁶⁸ The absence of significant
5 contamination in this area is the most likely explanation for this example, and cherry-
6 picking the results of one excavation among the hundreds of trenches and excavations
7 investigated and remediated at the Site does not constitute evidence of "fraud or
8 incompetence."

9 Petitioner also ignores the fact that Taylor was hired by NWE, not by TtEC. TtEC
10 did not have control over internal personnel hiring decisions made by NWE. In fact,
11 Bowers was the Radiation Safety Officer Representative at NWE at the time Taylor was
12 hired,⁶⁹ and presumably would have been involved in her initial hiring. At the time TtEC
13 invoked its license in March 2009, Taylor had been working at HPNS for three years and
14 was more than sufficiently qualified for the position she held at that time—notwithstanding
15 Petitioner's stated concerns about NWE's hiring practices.

16 Likewise, Thorpe Miller had adequate experience for his role at HPNS. Because
17 Miller is the son of Laurie Lowman, who worked at the Navy RASO, TtEC requested that
18 the Navy review whether any conflict of interest existed in hiring Miller. The Navy
19 determined that there was no conflict, and TtEC relied on the Navy's interpretation.⁷⁰
20 Miller's work managing the database onsite was valued, and TtEC followed the Navy's
21 direction to minimize the appearance of a conflict when his employment by TtEC was
22 questioned by competing contractors.⁷¹

23 In any event, Petitioner's spurious allegations regarding Taylor's and Thorpe's
24 employment at the Site have already been investigated by the NRC. There is no new,
25

26 ⁶⁸ Petition at p.28, ln. 25 to p.29, ln. 4.

27 ⁶⁹ See Bowers Decl. at ¶ 4.

28 ⁷⁰ See Email from Andrew Bolt to Erik Abkemeir *et al.*, Bowers Decl., Exhibit 3 at p. 1.

⁷¹ *Id.*

1 significant information in these allegations, or any of the other allegations made by
2 Petitioner, that would justify the NRC's acceptance of the Petition. Section 2.206 requires
3 the NRC to reject the Petition on that basis.

4 **V. THE SMITH DECLARATION AND THE NAVY'S DRAFT DATA EVALUATION**
5 **REPORTS DO NOT CONTAIN FACTS THAT ARE "CREDIBLE AND**
6 **SUFFICIENT TO WARRANT FURTHER INQUIRY."**

7 **A. Anthony Smith is a criminal who has demonstrated his willingness to**
8 **lie to advance his own financial interests.**

9 As discussed above, Anthony Smith's declaration in support of the Petition either
10 repeats or repackages allegations that have been previously investigated by the NRC.
11 But even if Smith's declaration raised new information, Petitioner must still provide
12 "supporting facts" that are "credible and sufficient to warrant further inquiry."⁷² The
13 allegations in Smith's declaration are either demonstrably false or so implausible as to be
14 completely lacking in credibility.

15 **1. Smith's claims about Building 351A are verifiably false.**

16 Smith alleges that he and Josh Hooper were instructed by HPNS Project Manager
17 Bill Dougherty to destroy highly contaminated radioactive samples taken from Building
18 351A in order to cut costs and avoid further costly remediation.⁷³ Smith also alleges that
19 he and Hooper were instructed to take new samples from the areas in the building
20 crawlspace known to be clean.⁷⁴ These claims are inconsistent with uncontroverted
21 evidence and are demonstrably false.

22 In fact, multiple rounds of remediation and resampling were conducted at Building
23 351A, beginning in April 2008 and continuing into January 2009.⁷⁵ Smith alleges that
24 TtEC Project Manager Bill Dougherty was motivated by a desire to avoid the expense of

25 ⁷² MD 8.11, Part III(C)(1)(a)(ii).

26 ⁷³ Smith Decl. at ¶ 10.

27 ⁷⁴ *Id.* at ¶¶ 10-11.

28 ⁷⁵ See Portions of Building 351A Logbook, attached as Exhibit 4.

1 renting a vacuum truck to remediate. However, TtEC did hire an independent
2 subcontractor to remediate Building 351A using a vacuum truck, not once but twice—in
3 both October and December 2008.⁷⁶ This evidence contradicts Smith's allegation that
4 Dougherty did not want to rent a vacuum truck. Following the initial remediation, ten
5 samples were determined to be above the release criterion, requiring a second round of
6 vacuum remediation and sampling, which was conducted in December 2008.⁷⁷
7 Confirmatory sampling was conducted after each round of remediation. Final status
8 survey samples demonstrated that remediation goals were met.⁷⁸

9 Even more implausible is Smith's allegation that Dougherty instructed Hooper and
10 him to "destroy" the soil samples and "any related documentation," after laboratory test
11 results showed that the samples had "some of the highest radioactive readings ever seen
12 on the Hunters Point site."⁷⁹ This allegation assumes, without explanation, that Smith and
13 Hooper had access to the samples after they were turned over to the laboratory, and the
14 laboratory results after they were produced by the laboratory.⁸⁰ In fact, once samples
15 were turned over to the lab, they were maintained in a secure area, which was
16 inaccessible to the Radiation Control Technicians (Smith and Hooper included). But even
17 if Smith or Hooper could have re-gained access to the physical samples after the lab
18 obtained them, copies of the chain of custody forms and electronic records of the
19 sampling data would remain in the lab's files.

20 Smith's allegation that he was able to identify clean soil from areas "marked with
21
22

23 ⁷⁶ See Sterling Environmental Corporation Invoices, attached as Exhibit 5.

24 ⁷⁷ See Final Status Survey Results, Bldg. 351A at 5-3 and 5-4 (ECSD-3211-0018-0009),
attached as Exhibit 6.

25 ⁷⁸ *Id.*

26 ⁷⁹ Smith Decl. at ¶ 10.

27 ⁸⁰ Logbook records demonstrate that samples were gathered and "turned in" following the
28 completion of the removal of contaminated soil in Building 351A. See Portions of Building
351A Logbook, attached as Exhibit 4.

1 flags"⁸¹ is also inconsistent with protocols used at the Site. Site engineers determined
2 random sampling locations by use of an EPA-approved software program, and then
3 precisely marked them in the field. Determining whether soil was clean required lab
4 sampling. Smith does not allege that he had access to the location software or
5 knowledge of the engineer's field markings.

6 Finally, although Smith claims that TtEC management was attempting to avoid
7 additional remediation to save costs, there was no profit motive for faking the results of
8 this sampling. The work was performed under a cost reimbursable contract with the
9 Navy, with billing of actual costs allowed on a monthly basis. There was no reason for
10 TtEC management to avoid the required remediation.

11 Given these facts, the only plausible conclusion is that Smith's statements
12 regarding Building 351A are fabricated.

13 **2. Smith's claims regarding the Parcel A sample are also**
14 **demonstrably false.**

15 Smith asserts that in 2009 he was instructed to collect a sample at Parcel A and
16 the following morning was instructed to put it back because it was "hot."⁸² Smith alleges
17 that the sample showed a cesium-137 (Cs-137) concentration of 2-3 picocuries per gram
18 (pCi/g).⁸³

19 This sample was never taken. 9,649 samples from the Site were collected and
20 analyzed in 2009, and of those samples, only 183 identified Cs-137 activities above the
21 release criterion. The highest concentration measured in 2009 was 1.0335 pCi/g.
22 Moreover, none of the samples taken in 2009 were taken in the area along the Parcel A
23 fence line that is described in the Smith Declaration.

24 Smith's allegations are also inconsistent with management practices at the Site.
25
26

27 ⁸¹ Smith Decl. at ¶ 11.

28 ⁸² See Smith Decl. at ¶¶ 12-13.

⁸³ See *id.* at ¶ 13.

1 TtEC management would have immediately known of a sampling result that had such a
2 high concentration of Cs-137. Such an unexpectedly high concentration would have
3 triggered a report to management immediately, as it would have required revising the
4 scope of work for Parcel A. There is no conceivable way that Smith could have submitted
5 a single sample for lab testing, and then retrieved and destroyed it—all outside of
6 established Site protocols—without anyone in the lab or management being informed of
7 such an abnormal sampling result. Yet after multiple investigations by the Navy and the
8 NRC, there is nothing to suggest that anyone onsite was notified or aware of any such
9 sample.

10 Finally, Smith claims to have been instructed to collect a single sample to
11 determine background radiation levels.⁸⁴ However, taking a single sample would have
12 been completely contrary to established site protocols. Single samples are not
13 representative of background levels due to statistical variations; collecting a large enough
14 set is critical for accurate analysis (typically 20 samples). Smith would not have been
15 instructed to collect a single sample to determine background radiation levels as he
16 claims.

17 Despite the utter lack of plausibility of Smith's allegations, the California
18 Department of Public Health ("CDPH") is currently performing radiological gamma
19 scanning surveys of Parcel A-1 to ensure there is no risk to the public. Initial scanning
20 reports demonstrate that there is no contamination or risk to the public, and no evidence
21 of elevated concentrations of Cs-137.⁸⁵ Final data analysis and reporting is expected in
22

23 ⁸⁴ Smith Decl. at ¶ 12.

24 ⁸⁵ California Department of Public Health, Radiation Health and Safety Scanning Survey:
25 Progress Update No.'s 1-8 (July 20 and 27, Aug. 3, 10, 17, 24 and 31, and Sept. 13,
26 2018), available at [https://www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/RHB-
27 Environment/Hunters-Point-Naval-Shipyard-Parcel-A-1-Survey.aspx](https://www.cdph.ca.gov/Programs/CEH/DRSEM/Pages/RHB-Environment/Hunters-Point-Naval-Shipyard-Parcel-A-1-Survey.aspx), attached at Exhibit
28 7. CDPH Progress Update No. 8 reported the discovery of a single radium deck marker
that posed no risk to the residents living in the area. See Progress Update No. 8 at p.1
("Radiation readings before removal indicate that there would not have been any health
or safety hazard to anyone who happened to be at that spot previously.").

1 the coming months.⁸⁶ The CDPH's sampling will undoubtedly confirm that Smith is lying,
2 and that the story he tells about finding elevated Cs-137 concentrations on Parcel A is
3 fictional.

4 **3. Petitioner's allegations relating to fraudulent building scans and**
5 **data reporting rely on Smith's unreliable and unsubstantiated**
6 **claims.**

7 Petitioner's allegations relating to improper building scans and building survey
8 data reporting also rely on the Declaration of Anthony Smith.⁸⁷ Smith alleges that he and
9 other technicians at the Site were instructed to "just get numbers," and that they did so by
10 holding the radiation detector in the same spot or putting it down in one place for up to
11 thirty minutes while readings were recorded.⁸⁸ Smith also asserts that building survey
12 data was altered to "avoid additional radiological remediation work" at the Site, and that
13 other Radiation Control Technicians and Supervisors were aware of the data
14 manipulation.⁸⁹

15 Smith's allegations make no sense. The only reason to put his radiation detector
16 down in one spot and "just get the numbers" would be Smith's own motivation to not
17 perform the repetitive, monotonous action of moving the scanner throughout the building.
18 TtEC managers would have no motivation to pay Smith to sit around generating fake
19 data.

20 With respect to the alleged data alteration, Smith played no role in data entry, as
21 his declaration makes clear. The majority of this work was completed by professionals
22 working in trailers at the Site. Smith would not have been in these areas, nor would he
23 have had knowledge of these tasks. Moreover, the data entry process at the Site required

24 ⁸⁶ California Department of Public Health, *Hunters Point Naval Shipyard –Parcel A-1*
25 *Radiation Survey Request* (July 5, 2018), [https://www.cdph.ca.gov/Programs/CEH/
26 DRSEM/CDPH%20Document%20Library/RHB/Environment/Final%20Hunters%20Point
%20-%20Parcel%20A1%20-%20Summary.pdf](https://www.cdph.ca.gov/Programs/CEH/DRSEM/CDPH%20Document%20Library/RHB/Environment/Final%20Hunters%20Point%20-%20Parcel%20A1%20-%20Summary.pdf).

27 ⁸⁷ *Id.*

28 ⁸⁸ Smith Decl. at ¶ 25.

⁸⁹ *Id.* at ¶¶ 26-27.

1 significant amounts of manual spreadsheet work—which Smith now mischaracterizes,
2 deliberately or otherwise, as intentional data manipulation. His contentions that TtEC
3 managers directed him and others to intentionally falsify building scan data are not
4 credible.

5 **4. Smith's claims regarding falsified chain of custody documents**
6 **are unsupported.**

7 Smith claims that one individual, Tina Rolfe, would fill out COC forms while others
8 were in the field.⁹⁰ While it is possible that some chain of custody information, such as
9 the sample identification numbers, was filled in before sampling was conducted, each
10 sampler was required to sign off on the sample COC before the forms were delivered to
11 the lab. Even if the handwriting on some portions of the COC is different, it does not
12 mean that the COC forms are inaccurate.

13 Additionally, TtEC and the NRC have all investigated claims of falsified soil
14 samples and associated COC documents. Hubbard and Rolfe have admitted to falsifying
15 limited sampling data in 2012, and the disparity in sampling times was identified during
16 the course of these investigations. However, none of these prior investigations
17 determined that there was systemic, rampant fraud in the COC documentation, as Smith
18 falsely alleges.

19 **5. Smith's has no direct knowledge to support his claim that**
20 **contaminated soil was shipped offsite.**

21 Smith alleges that a conveyor system utilized in 2006 resulted in contaminated
22 soils being shipped offsite.⁹¹ Yet, Smith himself admits that he did not work on the
23 conveyor operation.⁹² Smith's allegations that the speed was increased and monitors
24
25

26 ⁹⁰ *Id.* at ¶¶ 21-23.

27 ⁹¹ Smith Decl. at ¶¶ 28-32.

28 ⁹² *Id.* at ¶ 29.

1 were silenced are based entirely on rumors that Smith "learned" while onsite;⁹³ he has no
2 direct knowledge of any impropriety.

3 TtEC identified a limited issue with the conveyor in 2006, when NWE's license was
4 active at the Site. TtEC investigated, identified the issue, remedied the problem, and
5 ensured that all impacted soil was appropriately rescanned.⁹⁴ Smith's claims demonstrate
6 his lack of understanding of Site remediation protocols, and his willingness to make false
7 allegations based on speculation and hearsay.

8 **6. Anthony Smith is currently being prosecuted on felony charges**
9 **and has financial problems that explain why he is willing to**
10 **make false statements to the NRC.**

11 Apart from the implausible nature of his allegations, Smith is simply not a credible
12 witness. Smith is an abusive person and is currently being prosecuted for assault,
13 battery, family violence, and terroristic threats, arising from his threats to kill his former
14 girlfriend.⁹⁵ In addition, Smith has had two contempt of court orders filed against him,⁹⁶
15 has been cited for operating a vehicle while impaired,⁹⁷ and failed to pay debts owed to a
16 creditor, resulting in a default judgment against him.⁹⁸

17 Smith has apparently chosen to falsify evidence to support legal action he hopes
18 will result in a financial windfall for himself, to allow him to escape from his financial
19 troubles. His attorney David Anton is also familiar with the falsification of evidence,
20 having been suspended by the California State Bar after he "admitted he fabricated
21 evidence" in a wrongful termination case filed in federal court.⁹⁹ The NRC should not

22 ⁹³ See *id.*

23 ⁹⁴ See explanation above at footnote 38.

24 ⁹⁵ *State of Georgia v. Anthony James Smith*, Union County Superior Court Case No.
2017-CR-221-SG, attached at Exhibit 8.

25 ⁹⁶ See *Smith v. Smith*, Contempt Orders 2002 and 2003, attached at Exhibit 8.

26 ⁹⁷ See e.g., A. Smith Citation for DUI, attached at Exhibit 8.

27 ⁹⁸ See Default Judgment, attached at Exhibit 8.

28 ⁹⁹ See Attorney Licensee Profile, David C. Anton, State Bar No. 94852, available at
<http://members.calbar.ca.gov/fal/Licensee/Detail/94852>.

1 spend taxpayer resources further investigating false allegations advanced by a criminal
2 and an admitted fraudster.

3 **B. The Draft Navy Data Evaluation Reports are scientifically unsound,**
4 **and in any event do not find actual evidence of data manipulation.**

5 The Draft Data Evaluation Reports ("Draft Reports") discussed in Petitioner's
6 supplemental pleadings are not new, credible evidence that would justify accepting the
7 Petition.

8 First, even if taken at face value, the Draft Reports only tentatively conclude that
9 there is "potential evidence" of "potential data manipulation." Whatever the term "potential
10 evidence" means, it is not specific, credible evidence that would support reopening the
11 NRC's closed investigation of TtEC.

12 Second, and more fundamentally, the methodology of the Draft Reports is deeply
13 flawed, and the Reports' conclusions are not based on sound science. The Draft Reports
14 do not base their analysis on the contractual and regulatory requirements that governed
15 TtEC's work at HPNS. Rather, they rely on arbitrary logic tests, inappropriate statistical
16 analyses, and misleading graphics, all of which are misapplied and misinterpreted to
17 incorrectly identify areas of potential data manipulation. The misuse of the logic tests,
18 statistical analyses, and misleading graphics results in a large percentage of HPNS data
19 being incorrectly identified as potentially suspect. In addition, the Draft Reports do not
20 consider alternative scientific explanations for any potential data issues, such as the well-
21 documented, highly variable soil conditions at HPNS or sensitivity to background
22 radiation levels.

23 The "logic tests" used in the Draft Reports impose a series of arbitrary
24 requirements on the conditions under which samples are collected (e.g., the relative
25 timing of sample collection and analysis) and identify any deviation from those arbitrary
26 requirements as evidence or "potential evidence" of "potential data manipulation."
27 However, the logic tests have no foundation in the contractual requirements for work at
28 the Site, nor do they have any scientific or technical foundation. For example, re-analysis

1 of samples according to the laboratory Standard Operating Procedures approved by the
2 Navy, which is part of ordinary field sampling or laboratory operations, results in failure of
3 at least one logic test used in the Draft Reports. Moreover, the Draft Reports fail to
4 account for benign or innocent errors in data and information processing that are
5 unavoidable in large scale projects. In addition, the Draft Reports simply assume that any
6 location downgradient from a contaminated area is potentially suspect, without any actual
7 evidence of irregularities in the data or in data collection procedures. Failure to meet the
8 requirements imposed by these arbitrary logic tests is not evidence of data irregularities.

9 The “statistical tests” used in the Draft Reports are also flawed, and in some
10 cases, they are not actually statistical tests at all. For example, the defects in the Draft
11 Reports’ statistical analysis include the following:

- 12 ▪ The Draft Reports’ use of the Kolmogorov-Smirnov (“KS”) test to identify
13 “statistically different” populations of data ignores natural heterogeneity in
14 soils at the Site and differences in conditions under which samples were
15 collected.
- 16 ▪ The application of Benford’s Law tests to data with an insufficiently wide
17 range of values (e.g., Ac-228 data) incorrectly identifies hundreds of data
18 points as potentially suspect.
- 19 ▪ The Draft Reports identify data as suspect based on information that is
20 intended solely to trigger further investigation (e.g., scan surveys), and not
21 based on release criteria established by the Navy and the EPA, contrary to
22 established NRC guidance.¹⁰⁰
- 23 ▪ The hierarchical “clustering” analysis performed in the Draft Reports is not a
24 statistical test at all, but rather, a subjective approach to data assessment.
- 25 ▪ The confidence intervals in the Draft Reports are either computed

27 ¹⁰⁰ NRC *et al.*, Multi-Agency Radiation Survey and Site Investigation Manual
28 (“MARSSIM”) (Aug. 2000), available at https://www.epa.gov/sites/production/files/2017-09/documents/marssim_manual_rev1.pdf.

1 incorrectly or based on arbitrary unstated assumptions.

- 2 ▪ The Draft Reports do not provide any information about the procedures
3 used to identify “outliers” in the dataset or to flag unusual data, and the
4 large number of outliers identified in the Draft Reports strongly suggest the
5 methodology generated results that are meaningless. Further, the flagging
6 of outlying values is inconsistent, and is inappropriately based on a
7 univariate as opposed to a multivariate analysis.

8 The misapplication of these statistical tests results in a large percentage of data
9 being incorrectly identified as potentially suspect. Moreover, even where statistical
10 differences may be present, the Draft Reports do not consider alternative scientific
11 explanations for the differences, such as the highly variable soil conditions, or variations
12 in background radiation levels (which are in some cases very close to the remediation
13 goals at the Site). Thus, it is clear that the Draft Reports do not provide an objective
14 analysis of the data collected at HPNS, and they are certainly not credible, new evidence
15 of alleged license violations that would support accepting the Petition under 10 C.F.R.
16 § 2.206.

17 **VI. CONCLUSION**

18 The NRC should reject the Petition because Petitioner has failed to meet the
19 criteria for acceptance set forth in 10 C.F.R. § 2.206. Petitioner has not presented
20 significant new information or demonstrated why the NRC's prior investigations are
21 insufficient to address Petitioner's concerns. The evidence that Petitioner submitted in
22 support of its allegations of fraudulent conduct are either demonstrably false or utterly
23 lacking in credibility. There is no indication that upper level TtEC management had any
24 knowledge of the admitted or alleged falsifications that the NRC previously investigated.
25 TtEC has never knowingly provided false data to the NRC and has fully complied with the
26 confirmatory orders issued by the NRC following its investigation. Moreover, the EPA, the
27 Navy, and state and local officials all agree that the Site is safe and there is no health risk

28

1 to the public.¹⁰¹ For these reasons, Petitioner has failed to present credible, new
2 information justifying a re-opening of the NRC's investigations, and the NRC should deny
3 the Petition.

4 Dated: September 19, 2018

5 By: 

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17
18
19 ¹⁰¹ See Navy, Fact Sheet Hunters Point Naval Shipyard Radiological Data Review (2017)
20 at p. 2 ("Investigations show that people who live, work, and visit HPNS and adjacent
21 properties are safe."), available at [https://www.bracpmo.navy.mil/content/dam/bracpmo/
22 california/former_naval_shipyard_hunters_point/pdfs/restoration_advisory_board/2017Co
23 mmunityInformationalMeetings/HP_201702_FactSheet_Rad.pdf](https://www.bracpmo.navy.mil/content/dam/bracpmo/california/former_naval_shipyard_hunters_point/pdfs/restoration_advisory_board/2017CommunityInformationalMeetings/HP_201702_FactSheet_Rad.pdf); EPA, Cleanup
24 Activities, Treasure Island Naval Station-Hunters Point Annex, San Francisco, CA ("The
25 most recent five-year review concluded that response actions at the site are in
26 accordance with the remedy selected by EPA and that the remedy continues to be
27 protective of human health and the environment."), available at [https://cumulis.epa.gov/
28 supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0902722#Done](https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.Cleanup&id=0902722#Done); San
Francisco Office of Community Investment and Infrastructure, Informational
Memorandum Hunters Point Shipyard Environmental Remediation Update; Hunters Point
Shipyard Redevelopment Project Area (Oct. 4, 2016) at p. 2 ("Based on ongoing reviews
of all the available information, the City's DPH continues to conclude there is no
immediate health risk to workers, residents, and artists who currently access the site."),
available at [https://sfocii.org/sites/default/files/Documents/Project%20Areas/HPSY/
RAD/HPS%20-%20CAC%20Info%20Memo%2011102016.pdf](https://sfocii.org/sites/default/files/Documents/Project%20Areas/HPSY/RAD/HPS%20-%20CAC%20Info%20Memo%2011102016.pdf).

EXHIBIT 1

23 January 2007

MEMORANDUM FOR THE RECORD

From: Director, Radiation Support and Navy Low-Level Radioactive Waste,
Naval Sea Systems Command Detachment, Radiological Affairs Support Office (RASO)

Subj: QUALIFICATION OF RADIOLOGICAL SUBCONTRACTOR AT HUNTERS POINT
NAVAL SHIPYARD

1. The Navy has contracted for radiological work to be performed as part of the environmental restoration program for Hunters Point Shipyard (HPS), San Francisco, California which is a former Navy shipyard that was closed by the Base Realignment and Closure (BRAC) Program. Currently, the prime contractor for the radiological work is TetraTechECI who has subcontracted all radiological support operations to New World Environmental dba New World Technology (NWT).
2. HPS has a very unique and extensive radiological history. Special considerations must be applied when selecting a contractor to perform radiological support work at the site. These considerations include:
 - a. Ability to enact and perform all radiological work at the site under their own Nuclear Regulatory Commission (NRC) Broad-scope License which can cover all of the radioisotopes of concern and work requirements at HPS.
 - b. Ability to provide an on-site radiological laboratory that can perform alpha spectroscopy, gamma spectroscopy, and strontium-90 analyses and provide results within 72 hours of receipt of the samples.
 - c. Experience in and ability to provide all types of radiological support, perform indoor and outdoor radiological surveys, and control and monitor radiological work sites.
 - d. Experience in and ability to monitor and control any radioactive waste found as the result of radiological operations and store the waste under authority of the NRC Broad-scope License.
 - e. Knowledge of previous radiological operations at HPS, the resulting 93 radiologically-impacted sites and the ability plan for, support and perform large-scale radiological remediations and free-release surveys.
 - f. Experience in and ability to provide and operate a motorized gamma scan survey instrumentation system for performance of large scale outdoor radiological surveys.
 - g. Experience in and ability to support emergency response actions involving radiologically-impacted areas at HPS.
 - h. Experience in and ability to adapt radiological support for large-scale deconstruction operations in radiologically impacted areas, including removal of sanitary sewer and storm drain systems.

3. NWT is singularly qualified in its ability to provide all of the above requirements for providing radiological support at HPS and has extensive experience in providing radiological support at a remote work site. Of particular note is their ability to perform strontium-90 and alpha spectroscopy analysis in the field and provide results within 72 hours. This essential requirement is necessary to allow contractors to meet production schedules and the Navy to meet property turnover timelines and other radiological contractors cannot meet this requirement. Additionally, NWT has the NRC Broad-scope License that covers all radioisotopes of concern as well as extensive experience at HPS and similar work sites in monitoring all types of radioactivity and running a large-scale radiological operation. Currently NWT is the only available contractor that can provide the radiological support required at HPS.


LAURAL LOWMAN

EXHIBIT 2



TETRA TECH EC, INC.

March 13, 2009
TTEC-ADM-09-0021

U.S. Nuclear Regulatory Commission, Region IV
Attention: Director, Division of Nuclear Material Safety
612 E. Lamar Blvd, Suite 400
Arlington, TX 76011-4125

**SUBJECT: TETRA TECH EC, INC.
NOTIFICATION OF LICENSE USE AT HUNTERS POINT SHIPYARD
MATERIALS LICENSE NO. 46-27767-01
DOCKET NUMBER 030-36414**

Dear Director:

For the past several years Tetra Tech EC, Inc. has been performing decontamination and remediation activities for the Department of Navy at the Hunters Point Shipyard (HPS) in San Francisco, CA, under the New World Environmental (dba New World Technology) U.S. NRC Radioactive Materials License 04-27745-01.

Tetra Tech EC, Inc. has made a business decision to perform this work under the Tetra Tech EC, Inc. U.S. NRC Radioactive Materials License 46-27767-01. In accordance with License Condition 14, Tetra Tech EC, Inc. is informing you of our intent to initiate activities under the subject license at the HPS.

The HPS site lies entirely within the corporate boundaries of the City and County of San Francisco, California, near the County's southern boundary with San Mateo County. HPS is located on San Francisco Bay in the southeast corner of San Francisco. The site encompasses approximately 848 acres, including approximately 416 acres on land, at the point of a high, rocky, 2-mile-long peninsula projecting southeastward into San Francisco Bay. The estimated date of initiation of license activities is March 30, 2009 with completion estimated to be December 31, 2010.

The work activities involve removal of potentially contaminated soil and sewer/storm drain lines, building decontamination, remediation, Multi-Agency Radiation Survey and Site Investigation based surveys, and other remediation and site restoration activities in support of the Department of Navy. Radioactive wastes generated as part of these activities will be packaged, transported and disposed of by a separate licensee under contract to the Department of Defense Executive Agency for Low-Level Radioactive Waste.

The delineation of license responsibilities will be documented in a Memorandum of Agreement (MOA) between the licensees and the DON Radiological Affairs Support Office (RASO).



3200 George Washington Way, Suite G, Richland, WA 99354
Tel 509.372.5800 Fax 509.372.5801
www.tteci.com

Should you have any questions with this matter, please contact me at (509) 371-0140.

Sincerely,

A handwritten signature in black ink, appearing to read "Cliff J. Stephan". The signature is fluid and cursive, with a long horizontal stroke extending to the right.

Clifford J. Stephan
Radiation Safety Officer
TETRA TECH EC, INC.
3200 George Washington Way, Suite G
Richland, WA 99354

CJS/mph

Cc: File

EXHIBIT 3



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
475 ALLENDALE ROAD
KING OF PRUSSIA, PENNSYLVANIA 19406-1415

JAN 5 2012

Ms. Susan V. Andrews
167 Cleo Rand Lane
San Francisco, CA 94124

RI-2011-A-0113

Subject: Concerns You Raised to the NRC Regarding Hunters Point Naval Shipyard

Dear Ms. Andrews:

This letter pertains to two concerns that you previously raised to the NRC during your interview on October 26, 2011, with Mr. Donrich Young, a Special Agent with the Region I Field Office, NRC Office of Investigations (OI). The two concerns were related to the health physics program at Hunters Point Naval Shipyard. These concerns were acknowledged to you in a letter dated November 17, 2011.

Since that date, you have provided the NRC information regarding additional concerns that you have regarding the Hunters Point Naval Shipyard. Specifically, we have received: (1) a string of your e-mails from Ms. Catherine Daly, Deputy Labor Commissioner, State of California, on November 21, 2011; (2) a voice message that you left for me on December 10, 2011; (3) an e-mail that you sent to Special Agent Young on December 10, 2011, which included comments regarding our acknowledgment letter to you dated November 17, 2011; and (4) notes regarding your telephone discussion on December 11, 2011 with Mr. R. Munoz from the NRC Region IV Office in Texas.

Based on our review of your additional information, we have identified twenty new concerns under NRC regulatory jurisdiction (Concerns 3 through 22) as described in Enclosure 1. We have responded to several of your concerns (i.e., Concerns 4, 8, 20, and 21). We have initiated actions to examine the remaining concerns. If the descriptions of these concerns as documented in the enclosure are not accurate, please contact me so that we can assure that they are appropriately described prior to the completion of our review. The NRC normally completes evaluations of technical concerns within six months, although complex issues may take longer.

In evaluating your concerns, the NRC intends to take all reasonable efforts not to disclose your identity to any organization, individual outside the NRC, or the public. It is important to note, particularly if you raised these concerns internally, that individuals can and sometimes do surmise the identity of a person who provides information to the NRC because of the nature of the information or because of other factors outside our control. In such cases, our policy is to neither confirm nor deny the individual's assumption. In addition, if a request is filed under the Freedom of Information Act (FOIA) related to your concerns, to the extent consistent with that act, the information provided will be purged of names and other potential identifiers. Further, you should be aware that you are not considered a confidential source unless confidentiality has been formally granted in writing.

In our earlier letter to you dated November 17, 2011, you were provided an NRC brochure entitled "Reporting Safety Concerns to the NRC." The brochure discusses important information regarding the NRC allegation process, identity protection, and the processing of

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

claims of discrimination for raising safety concerns. If you need another copy of the brochure, please contact me via the NRC Safety Hotline at 1-800-695-7403 or you may view a copy at <http://www.nrc.gov/reading-rm/doc-collections/nuregs/brochures/br0240/>.

The NRC staff has reviewed your complaint of discrimination and has determined that an evaluation of Concern 22, as described in Enclosure 1, is warranted. The NRC will consider enforcement action against NRC-regulated facilities that are found to have discriminated against individuals for raising safety concerns. However, please understand that the NRC cannot require that a personal remedy be provided to you, such as back pay or reinstatement. Means by which you can pursue a personal remedy are described later in this letter.

If you wish, the NRC Office of Investigations (OI) can investigate your discrimination concern. During an investigation, OI gathers testimonial and documentary evidence related to your discrimination concern. Since performing such an investigation without identifying you would be extremely difficult, please be aware that your name will be disclosed during the course of an NRC investigation into your discrimination concern. If, based on the results of the OI investigation, the NRC determines that your discrimination concern is substantiated, we will consider enforcement action against the licensee, as appropriate. If you would like OI to initiate an investigation regarding your complaint of discrimination, please call me via the NRC Safety Hotline at 1-800-695-7403 within 10 days of receipt of this letter.

As an alternative to an investigation of your discrimination complaint by OI, you can participate in the NRC's Alternative Dispute Resolution (ADR) program, which offers mediation for handling a complaint of discrimination. Mediation is a voluntary process where two parties, you and your former employer, use an unbiased, neutral individual, or mediator, in an attempt to resolve and settle your complaint of discrimination with your former employer. If such an agreement is reached, the NRC will close your discrimination complaint upon settlement and will not investigate your claim of discrimination. If a settlement is not reached with your former employer, OI may initiate an investigation into your complaint of discrimination. As mentioned above, the NRC's ADR program is *voluntary*, and any participant may end the mediation at any time. More information on this program is included in the enclosed brochure, "Pre-Investigation ADR Program," and at <http://www.nrc.gov/about-nrc/regulatory/enforcement/adr.html>.

The NRC has asked Cornell University's Institute on Conflict Resolution (ICR) to aid you and your former employer in resolving your discrimination concern through ADR. If you choose to participate in the NRC's ADR program, you must contact ICR at 1-877-733-9415 (toll-free). We request that you make a decision regarding your interest in attempting mediation via the ADR program within 10 days of the date on which you receive this letter. You may contact ICR if you wish to discuss ADR in general, the NRC's ADR program, and any other information in which you are interested related to resolving your complaint using ADR. If you and your former employer wish to participate in the ADR program, ICR will assist you in the selection of a mediator who would meet with you and your former employer in an attempt to settle your complaint. If you select a mediator through ICR, there will be no charge to you or your former employer for the mediator's services. If you participate in the ADR program, please complete the program evaluation form (supplied by ICR) at the completion of the process so that we can evaluate the effectiveness of the program.

The NRC notes that employers are encouraged to develop similar dispute resolution processes internal to their company for use in conjunction with their own employee concerns programs. If you utilize your former employer's dispute resolution program to settle a discrimination concern,

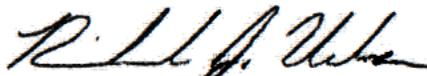
your former employer may voluntarily report the settlement to the NRC. If the NRC is notified of an internal settlement **before** an NRC OI investigation is initiated, the NRC will request a copy of such a settlement agreement (when completed, if negotiations are ongoing) from the former employer and review it to determine if it contains any restrictive agreements in violation of NRC employee protection regulations. If no such restrictive agreements exist, the NRC will close the discrimination complaint and will not perform an investigation.

Additionally, please note that while participation in the NRC's ADR program may result in negotiation of the issues that form the basis of your discrimination complaint with your former employer under Section 211 of the Energy Reorganization Act of 1974, the timeliness requirements (180 days) for filing a claim of discrimination with the U.S. Department of Labor (DOL) are in no way altered by the NRC's ADR program. In this aspect, we note that DOL has the authority to order personal remedies in these matters, and the enclosed brochure discusses the right of an individual to file a complaint with DOL if the individual believes that they have been discriminated against for raising safety concerns. For this reason, the filing of a discrimination complaint with DOL should be considered at the same time when you are considering use of the ADR program. While there is a likelihood that DOL may choose to await the completion of your ADR mediation, given the prospect of a mutually agreeable settlement, timely filing of a discrimination complaint with DOL assures that DOL will review your discrimination complaint in the event that ADR is unsuccessful. In order to protect your right to file a discrimination complaint with DOL under 29 CFR Part 24, "Procedures for the Handling of Retaliation Complaints Under Federal Employee Protection Statutes" (copy enclosed), you must file a written complaint with DOL within 180 days of the date of the alleged discriminatory action or the date on which you received any notice, in writing or otherwise, of an adverse personnel action (e.g., layoff or suspension), whichever occurred first. Any such complaint can be filed with DOL Regional Offices for the Occupational Safety and Health Administration (OSHA). Your complaint must describe the safety issue or issues that you raised, the resulting adverse personnel action taken against you, and the causal relationship between them. If you choose to file a complaint, it should be filed with:

US DOL/OSHA Region 9 Office
90 7th Street, Suite 18100
San Francisco, California 94103
(415) 625-2547 (Main Public - 8:00 AM - 4:30 PM Pacific)
(415) 625-2534 FAX

Thank you for notifying us of your concerns. We will advise you when we have completed our review. Should you have any additional questions, or if the NRC can be of further assistance in this matter, please call me toll-free via the NRC Safety Hotline at 1-800-432-1156, extension 5222 or contact me in writing at P.O. Box 80377, Valley Forge, PA 19484.

Sincerely,



Richard J. Urban
Senior Allegation Coordinator

Enclosures: As Stated

Concern 1:

You asserted that there was an occasion when Tetra Tech personnel did not perform surveys and/or frisks when they entered and exited a radioactively contaminated area. You stated that you saw this occur during the week of October 17, 2011.

Concern 2:

You asserted that another Tetra Tech Senior Health Physics Technician, who worked at the site, knew very little and did not really follow radiation safety principles.

Concern 3:

You asserted that "someone" was falsely signing CoC sample forms for "someone else", as evidenced by wrong handwriting and name misspelling.

Concern 4:

You asserted that there had been an increase in occupational accidents and mistakes at Hunters Point. You stated that staff was told to work quickly and ignore safety rules about not using cell phones or radios while driving.

Response to Concern 4:

The NRC determined that this concern involves a non-radiological worker safety issue that does not fall under NRC jurisdiction. The agency with jurisdiction in this matter is the Occupational Safety and Health Administration (OSHA). In accordance with a Memorandum of Understanding with OSHA, the NRC intends to notify the licensee about this concern and to refer your concern to the following OSHA area office; we also intend to contact you to see if you have any objection to your contact information being provided to OSHA. For any further information on this matter, you may contact the OSHA area office where the referral is to be made:

Region IX Federal Contact Numbers
90 7th Street, Suite 18100
San Francisco, California 94103
(415) 625-2547
(415) 625-2534 FAX

Concern 5:

You asserted that radiation safety training for Radiation Technicians (RTs) was lacking or inadequate.

Concern 6:

You asserted that the Project Manager refused to allow a Radiation Supervisor to discipline a Senior RT for failure to take a required test. You stated that the Project Manager was overheard saying that there will be "no write ups of anyone."

Concern 7:

You asserted that laborers are handling potentially contaminated soil without proper training and certification since they are processing soil samples for the lab. You stated that laborers have been observed working without wearing required gloves. You added that, in August 2010, laborers were surveying and sampling soil on the soil pads.

Concern 8:

You asserted that RTs were told to work quickly so as not to slow down remediation work. You stated that Tetra Tech work practices were "construction dominated" with production taking precedence over radiation safety.

Response to Concern 8:

The NRC staff reviewed this concern and determined that you did not identify any specific noncompliance with NRC requirements or regulations. However, we believe that your concern about production being placed over safety could possibly be viewed as a safety culture matter. For your information, in a Federal Register Notice dated January 24, 1989, the Commission's "Policy Statement on the Conduct of Nuclear Power Plant Operations," refers to safety culture as "the necessary full attention to safety matters" and the "personal dedication and accountability of all individuals engaged in any activity which has a bearing on the safety of nuclear power plants. A strong safety culture is one that has a strong safety-first focus." The Commission has also referenced the International Nuclear Safety Advisory Group's (INSAG) definition of safety culture as follows: "Safety Culture is that assembly of characteristics and attitudes in organizations and individuals which establishes that, as an overriding priority, nuclear plant safety issues receive the attention warranted by their significance." Your general statement that production takes precedence over radiation safety does not provide a nexus to there being a safety culture problem at Hunters Point Naval Station.

However, if you are aware of any additional specific radiological safety issues that have occurred as a result of a production over safety mentality and that fall within NRC jurisdiction, we would be interested in that type of information. If you or others have any such additional specific information to provide, please contact me via the phone number or postal address provided in the cover letter within 10 days of the date on which you receive this letter. If no additional information is received, we intend to take no further action on this matter at this time.

Concern 9:

You asserted that some RTs entered inaccurate information on radioactive waste storage bags because they do not understand their instruments. You stated that there has been confusion about the use of RO-20 meters.

Concern 10:

You asserted that some meters have not been calibrated correctly.

Concern 11:

You asserted that some survey records are corrected, when a mistake is made, by whiting out the mistake, correcting it, and then photo copying the form.

Concern 12:

You asserted that source storage locations have not always been posted or secured. You stated that, on at least one occasion, an RT was told to "hide it and lock up and go about your work."

Concern 13:

You asserted that TLDs have not always been located correctly on poles. You stated that they may be shielded or not placed at the right height or are not located on the posting pole.

Concern 14:

You asserted that the wrong individual was named as the authorized user on a posted materials license.

Concern 15:

You asserted that a supervisor attempted to alter the radiation work area postings to allow laborers to remove a pipe.

Concern 16:

You asserted that laborers removed a pipe from a radiation controlled area without the pipe being frisked for contamination.

Concern 17:

You asserted that a Tetra Tech employee brings her non-employee daughter to work and that the daughter has been seen moving potentially contaminated samples, entering and leaving a radiation controlled area without frisking, and drinking soda within a radiation controlled area. You stated that the employee intimidates other employees who question this practice by virtue of her personal relationship with a supervisor.

Concern 18:

You asserted that personnel do not always sign in and out on Radiation Work Permits and sometimes fail to frisk themselves when leaving radiation controlled areas. You stated that disparate discipline is applied for violators.

Concern 19:

You asserted that someone told you that there were "a lot of real problems" at Alameda, "not just little HR problems like here."

Concern 20:

You asserted that employees were falsifying their time sheets.

Response to Concerns 19 and 20:

The NRC determined that these concerns involve issues that do not fall under NRC regulatory jurisdiction. Agencies that may have jurisdiction in these matters would be the State of California Inspector General and/or the Naval Inspector General. We intend to refer both concerns to the Naval Inspector General. For any additional follow-up on these concerns, we have provided the contact information for these agencies:

Office of the Naval Inspector General
Building 172
1254 Ninth Street, S.E.
Washington Navy Yard DC
20374-5006
Telephone: (800) 522-3451
E-mail: NAVIGHotlines@navy.mil
FAX: (202) 433-2613

Office of the Inspector General
State of California
P.O. Box 348780
Sacramento, CA 95834-8780
Telephone: (800) 700-5952
FAX: (916) 928-5974

Concern 21:

You asserted that you were laid off on December 16, 2011, for attempts to address and correct observations considered adverse to industry standard radiation safety practices as well as regulatory license compliance, and for participating as a silent witness in a State of California Labor Commission discrimination hearing for another terminated employee.



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD., SUITE 100
KING OF PRUSSIA, PA 19406-2713

MAY 29 2013

Mr. Albert Perry
Vice President-Environmental, Safety, and Quality
Tetra Tech EC, Incorporated
1000 The American Road
Morris Plains, NJ 07950

RI-2011-A-0019

Subject: NRC Office of Investigations Case No. 1-2012-002

Dear Mr. Perry:

The Region I Field Office, NRC Office of Investigations (OI), initiated an investigation (Case No. 1-2012-002) on October 7, 2011, to determine whether a former Radiation Safety Officer (RSO) was discriminated against by Tetra Tech EC, Incorporated at the Hunters Point Naval Shipyard, for raising safety concerns. Based upon testimonial and documentary evidence developed during the OI investigation, the NRC was unable to conclude that the former RSO was subject to discrimination. Specifically, testimony indicated that the former RSO offered his/her resignation at one point, yet despite acceptance of his/her resignation, the former RSO received several offers from the company to work in alternate locations, which the former RSO refused.

Please note that final NRC investigation documents, such as the OI report described above, may be made available to the public under the Freedom of Information Act (FOIA) subject to redaction of information appropriate under the FOIA. Requests under the FOIA should be made in accordance with 10 CFR 9.23, Requests for Records, a copy of which is enclosed for your information.

Also, in accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

No response to this letter is required. Should you have any questions regarding this letter, please contact Mr. Marc Ferdas of my staff at (610) 337-5022.

Sincerely,

Raymond K. Lorson, Director
Division of Nuclear Materials Safety

Enclosure: As Stated

§ 9.23 Requests for Records

(a)(1) A person may request access to records routinely made available by the NRC under § 9.21 in person, by telephone, by e-mail, facsimile, or U.S. mail from the NRC Public Document Room, One White Flint North, 11555 Rockville Pike (first floor), Rockville, Maryland 20852-2738.

(i) Each record requested must be described in sufficient detail to enable the NRC Public Document Room staff to locate the record.

(ii) To obtain copies of records expeditiously, a person may open an account with the NRC Public Document Room reproduction contractor. Payment for reproduction services will be made directly to the contractor.

(2) [Reserved]

(b) A person may request agency records by submitting a request authorized by 5 U.S.C. 552(a)(3) to the Freedom of Information Act and Privacy Act Officer by an appropriate method listed in § 9.6 of this chapter. The request must be in writing and clearly state on the envelope and in the letter that it is a "Freedom of Information Act request." The NRC does not consider a request as received until the date it is actually received by the Freedom of Information Act and Privacy Act Officer.

(1) A Freedom of Information Act request covers only agency records that are in existence on the date the Freedom of Information Act and Privacy Act Officer receives the request. A request does not cover agency records destroyed or discarded before receipt of a request or which are created after the date of the request.

(2) All Freedom of Information Act requests for copies of agency records must reasonably describe the agency records sought in sufficient detail to permit the NRC to identify the requested agency records. Where possible, the requester should provide specific information regarding dates, titles, docket numbers, file designations, and other information which may help identify the agency records. If a requested agency record is not described in sufficient detail to permit its identification, the Freedom of Information Act and Privacy Act Officer will contact the requester within 10 working days after receipt of the request and inform the requester of the additional information or clarification needed to process the request.

(3) Upon receipt of a request made under paragraph (b) of this section, the NRC will provide written notification to the requester that indicates the request has been received, the name and telephone number of the NRC point of contact to find out the status of the request, and other pertinent matters regarding the processing of the request.

(4)(i) The NRC shall advise a requester that fees will be assessed if--

(A) A request involves anticipated costs in excess of the minimum specified in § 9.39; and

(B) Search and duplication is not provided without charge under § 9.39; or

(C) The requester does not specifically state that the cost involved is acceptable or acceptable up to a specified limit.

(ii) The NRC has discretion to discontinue processing a request made under this paragraph until--

(A) A required advance payment has been received;

(B) The requester has agreed to bear the estimated costs;

(C) A determination has been made on a request for waiver or reduction of fees; or

(D) The requester meets the requirements of § 9.39.

(c) If a requested agency record that has been reasonably described is located at a place other than at the NRC Web site, *http://www.nrc.gov*, the NRC Public Document Room, or the NRC headquarters, the NRC may, at its discretion, make the record available for inspection and copying at either of the locations.

(d) Except as provided in § 9.39--

(1) If the record requested under paragraph (b) of this section is a record available through the National Technical Information Service, the NRC shall refer the requester to the National Technical Information Service; and

(2) If the requested record has been placed on the NRC Internet Web site, under § 9.21, the NRC may inform the requester that the record is available at the NRC Web site, *http://www.nrc.gov*, and/or at the NRC Public Document Room, and that the record may be obtained in accordance with the procedures set forth in paragraph (a) of this section.

(e) The Freedom of Information Act and Privacy Act Officer will promptly forward a Freedom of Information Act request made under paragraph (b) of this section for an agency record to the head of the office(s) primarily concerned with the records requested, as appropriate. The responsible office will conduct a search for the agency records responsive to the request and compile those agency records to be reviewed for initial disclosure determination and/or identify those that have already been made publicly available at the NRC Web site, *http://www.nrc.gov*, and/or at the NRC Public Document Room.

[63 FR 2876, Jan. 20, 1998, as amended at 64 FR 48950, Sept. 9, 1999; 67 FR 67098, Nov. 4, 2002; 68 FR 58800, Oct. 10, 2003, 70 FR 34306, June 14, 2005]



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I

2100 RENAISSANCE BOULEVARD, SUITE 100
KING OF PRUSSIA, PENNSYLVANIA 19406-2713

JUL 8 2013

Mr. Albert Perry
Vice President-Environmental, Safety, and Quality
Tetra Tech EC, Incorporated
1000 The American Road
Morris Plains, NJ 07950

RI-2011-A-0138

Subject: NRC Office of Investigations Case No. 1-2012-032

Dear Mr. Perry:

The Region I Field Office, NRC Office of Investigations (OI), initiated an investigation (Case No. 1-2012-032) on March 23, 2012, to determine whether a contract Health Physicist Technician (HPT) working at the Hunters Point Naval Shipyard remediation site in Hunters Point, CA, was subjected to harassment and discrimination for raising safety concerns. The HPT was a subcontractor employed by New World Environmental, Inc. working for Tetra Tech, Pasadena, CA, who is the prime contractor for the remediation site. Specifically, the HPT alleged that after raising concerns to a Tetra Tech supervisor regarding the qualifications of laborers performing remediation work on site, the HPT's employment was terminated by the Tetra Tech Project Manager. Based upon testimonial and documentary evidence developed during the OI investigation, the NRC found insufficient evidence to substantiate that the HPT's employment was terminated for having raised safety concerns.

Also, in accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

No response to this letter is required. Should you have any questions regarding this letter, please contact Mr. Marc Ferdas of my staff at (610) 337-5022.

Sincerely,

Raymond K. Lorson, Director
Division of Nuclear Materials Safety

December 6, 2013

Mr. Albert Perry
Vice President-Environmental, Safety, and Quality
Tetra Tech EC, Incorporated
1000 The American Road
Morris Plains, NJ 07950

RI-2011-A-0113
RI-2012-A-0022

Subject: NRC Office of Investigations Case Nos. 1-2012-019 and 1-2012-037

Dear Mr. Perry:

The Region I Field Office, NRC Office of Investigations (OI), initiated two investigations, one on January 19, 2012, and one on April 4, 2012, to evaluate separate discrimination complaints by two contract employees who alleged they were terminated from employment for raising safety concerns while working for Tetra Tech EC, Inc., a contract decommissioning company at the United States Navy's Hunters Point Naval Shipyard. Based on testimonial and documentary evidence developed during the investigations, the NRC found insufficient evidence to conclude that either individual was subjected to discrimination for raising safety concerns.

Please note that final NRC investigation documents, such as the OI report described above, may be made available to the public under the Freedom of Information Act (FOIA) subject to redaction of information appropriate under the FOIA. Requests under the FOIA should be made in accordance with 10 CFR 9.23, Requests for Records, a copy of which is enclosed for your information.

Also, in accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

No response to this letter is required. Should you have any questions regarding this letter, please contact Mr. Marc Ferdas of my staff at (610) 337-5022.

Sincerely,

/RA/

James W. Clifford, Director
Division of Nuclear Materials Safety

Enclosure: As Stated

Mr. Albert Perry

2

RI-2011-A-0113

RI-2012-A-0022

Distribution:

R. Zimmerman, OE

R1Allegation Resource

J. Clifford, DNMS

M Ferdas, DNMS

D. Screnci, PAO

SUNSI Review Complete: MSF (Reviewer's Initials)

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OFFICE	DNMS:DB	OI:SAIC	RI:RC	ORA:SAC	DNMS:DD
NAME	M Ferdas	J. Teator	E Monteith	R Urban/slj/jrm	J Clifford
DATE	12/3/2013	12/3/2013	12/4/2013	12/4/2013	12/5/2013

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EXHIBIT 4

Mead.

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2-623

QUADRILLE

4-9-2008

0830 BEGIN BACKGROUND INSTRUMENTS

ADAM GIVES JOB BRIEFING.

CREW: MIGUEL, LOUISE

TG-99-3

0942 BEGIN REMOVING VENT LOUVERS

CB PROVIDES JOB COVERAGE

74 2

INSTRUMENTS USED.

1035 B351A-V001-001 WAS REMOVED FROM CEILING HVAC.

2min FIELD COUNT W/2360. RESULTS INDICATE BACKGROUND LEVELS

2360

S/N 227430/PR147591

2350

S/N 228709/PR194980

1040 BEGIN REMOVAL OF B351A-V001-002

1045 B351A-V001-002-REMOVED FROM CEILING HVAC

A 2min. FIELD COUNT W/2360 WAS PERFORMED. RESULTS INDICATE BKGD. LEVELS

1050 BEGIN REMOVAL OF B351A-V001-003

1055 B351A-V001-003 REMOVED, RESULTS INDICATE BKGD. LEVELS

1100 BEGIN REMOVAL OF B351A-V001-004

1112 REMOVAL OF B351A-V001-004 COMPLETE

2min. FIELD COUNT W/2360 WAS PERFORMED. RESULTS INDICATE BKGD LEVELS

1115 BEGIN REMOVAL OF B351A-V001-005

1123 REMOVAL OF B351A-V001-005 IS COMPLETE. RESULTS INDICATE BKGD LEVELS.

1128 BEGIN REMOVAL OF B351A-V001-006

1135 REMOVAL OF B351A-V001-006 IS COMPLETE. RESULTS INDICATE BKGD LEVELS.

1139 BEGIN REMOVAL OF B351A-V001-007

1146 REMOVAL OF B351A-V001-007 IS COMPLETE. RESULTS INDICATE BKGD. LEVELS

1151 STOP OPERATIONS FOR LUNCH

1238 BEGIN REMOVAL OF B351A-V001-008

1302 REMOVAL OF B351A-V001-008 IS COMPLETE. RESULTS INDICATE BKGD. LEVELS

1305 BEGIN REMOVAL OF B351A-V001-009

1313 REMOVAL OF B351A-V001-009 IS COMPLETE. RESULTS INDICATE BKGD. LEVELS

1316 BEGIN REMOVAL OF B351A-V001-010

1327 REMOVAL OF B351A-V001-010 IS COMPLETE. RESULTS INDICATE BKGD LEVELS

1331 BEGIN REMOVAL OF B351A-V001-015

1336 REMOVAL OF B351A-V001-010 IS COMPLETE. RESULTS INDICATE BKGD LEVELS

1337 CREW STOP TO INSTALL ADDITIONAL LIGHTING IN HALL

1345 BEGIN REMOVAL OF B351A-V001-016

1350 REMOVAL OF B351A-V001-016 IS COMPLETE RESULTS INDICATE BKGD LEVELS

1353 BEGIN REMOVAL OF B351A-V001-017

1400 REMOVAL OF B351A-V001-017 IS COMPLETE RESULTS INDICATE BKGD LEVELS

1402 BEGIN REMOVAL OF B351A-V001-019

1406 REMOVAL OF B351A-V001-019 IS COMPLETE RESULTS INDICATE BKGD LEVELS

1410 BEGIN REMOVAL OF B351A-V001-018

1419 REMOVAL OF B351A-V001-018 IS COMPLETE RESULTS INDICATE BKGD LEVELS

1422 BEGIN REMOVAL OF B351A-V001-020

1430 BREAK

1450 CONTINUE

Techs:
P. Delong
C. Bell
A. Smith

Friday 1-16-08

Weather: Clear & Cool; 51°

Model:	S/N	PR/N	Cal Due
M-3	11520		
2350	221013	PR 194982	4-15-09
M-12	180429	PR 191715	1-8-10

- 8:10 ADAM GIVES TSA/SAFETY BRIEF.
8:13 BILL BRENNEN, PRESTON DELONG, ANTHONY SMITH MAKE ENTRY INTO SURVEY UNITS R + S. TO START SETTING POINTS AND SAMPLING.
ALLEN KELLY, CAUAYO, TOMMY JACKSON ARE ON CONFINED SPACE WATCH. CAREY BELL PROVIDES COMPLETE H.P. COVERAGE.
8:50 PRESTON D. COMES OUT OF CONFINED SPACE AREA.
9:30 SAMPLING IS DONE FOR SURVEY UNIT S (S33-S52). ANTHONY CONTINUE FINAL STATICS FOR SU-S.
9:40 PRESTON BRINGS OUT FULL SAMPLE JARS FROM SU-S AND REPLACES WITH EMPTY SAMPLE JARS FOR SU-R. PRESTON MAKES ENTRY.
10:18 ANTHONY COMES OUT OF SU-S FOR WATER BREAK.
11:45 BILL + MARTIN EXIT CRAWL SPACE AFTER PLOTTING POINTS FOR SU-R.
11:55 ANTHONY + PRESTON FINISH SU-R SOIL SAMPLES.
12:15 PRESTON ENTERS CRAWL SPACE TO BEGIN STATICS IN SU-R.
14:22 BILL + MARTIN ENTER CRAWL SPACE TO PLOT POINTS FOR SU-U.
15:55 PRESTON + ANTHONY EXIT SITE (CRAWL SPACE) - SU-S.
16:00 BILL + MARTIN EXIT CRAWL SPACE AFTER COMPLETING PLOT POINTS FOR SU-U.
SECURE BLDG LEAVE AREA!

SATURDAY

1-17-09

WEATHER: Sunny, WARM

8:00 CREW ON SITE, SETUP
CREW: ANTHONY S., PRESTON D., OSCAR, ALLEN KELLY, CAREY BELL

INSTRUMENTS USED:

	S/N	PR	CAL DUE
M-12	180429	PR 191715	1-8-10
M-12	167168	PR 191712	5-12-09
2350	221013	PR 194982	4-15-09

- 8:05 CREW HAS SAFETY/TSA BRIEF.
9:55 PRESTON, ANTHONY, OSCAR ENTER CRAWL SPACE TO BEGIN SAMPLING SOIL FROM SU-U.
OSCAR BEGINS REMEDIATING SOIL FROM SU-S.
ALLEN KELLY, MIGUEL GARCIA, CAREY BELL PROVIDE WATCH FOR ENTRY PERSONNEL.
11:45 - REMEDIATION CREW EXITS CRAWL SPACE. BREAK FOR LUNCH.
SAMPLES FROM SU-U ARE COMPLETELY COLLECTED.
12:40 - ANTHONY, PRESTON, OSCAR ENTER CRAWL SPACE TO CONTINUE REMOVING REMEDIATED SOIL. CAREY PROVIDES H.P. COVERAGE WHILE HELPING ENRIQUE AND ALLEN ATTEND TO ENTRANTS!
13:45 - CONFINED SPACE CREW COMPLETE REMOVAL OF REMEDIATED SOIL. EXIT CRAWL SPACE. (24 5gal Buckets REMOVED)
TURN IN SAMPLES.
14:20 CLEAN UP SITE.
14:40 SECURE SITE, TURN IN PAPERWORK + EQUIPMENT.

MONDAY

1-19-09

WEATHER: Sunny

7:30: ONSITE, Setup
CREW - CARY, PRESTON, Bill B. ENRIQUE, Horse, Allen IC

8:00 Bill and ENRIQUE ENTER CRAWLSPACE TO MAKE POINTS
IN SU-

10:50 Bill and ENRIQUE exit

INSTRUMENTATION USED

2350
M-B

221013
92650

PR 194982
PL 116824

4-15-09
4-9-09

- 1245 Begin cleanup OF BLDG. PRESTON MAKES WAY INTO CRAWLSPACE TO PULL OUT DEBRIS, TOOLS AND VACUUM HOSE
- 1340 PRESTON EXITS CRAWLSPACE
- 1440 TAP UP HOSES. LABORER TAKES HOSE TO 406, BLDG
- 1540 SECURE BUILDING. END OF WORK DAY



EXHIBIT 5

SUBCONTRACT NUMBER 1030985

PROGRESS BILLING #6

DATE: 10/31/2008
 SUPPLIER: STERLING ENVIRONMENTAL CORPORATION
 10203 E STREET
 OAKLAND, CA 94603
 CONTACT: BRIAN HOPPE
 PHONE: 510-638-2800
 SEC JOB # 5986

SHIP TO: TETRA TECH EC, INC.
 270 NIMITZ (BLDG. 270)
 HUNTERS POINT SHIPYARD
 SAN FRANCISCO, CA 94124
 ATTN: MR. BILL DOUGHERTY
 BILL TO: TETRA TECH EC, INC.
 1230 COLUMBIA ST., SUITE 750
 SAN DIEGO, CA 92101
 ATTN: ACCOUNTS PAYABLE

VAC LOADER EQUIPMENT RENTAL & CONSUMABLE/DISPOSABLE COSTS

DATE	DESCRIPTION - ITEM	QUANTITY	UNITS	UNIT PRICE	AMOUNT
10/13/2008	MOBILIZATION OF VACUUM SYSTEM	1	EACH	\$ 1,700.00	\$ 1,700.00
10/14/2008	VAC LOADER RENTAL	8	DAYS	\$ 600.00	\$ 4,800.00
10/23/2008	8 DAYS				
10/24/2008	DEMobilIZATION OF VACUUM SYSTEM	1	EACH	\$ 1,000.00	\$ 1,000.00
10/27/2008	5 FILTERS, INCLUDING HEPA'S	1	EACH	\$ 2,602.00	\$ 2,602.00
10/27/2008	100 LINEAL FEET OF 5 INCH VAC HOSE	1	EACH	\$ 3,406.00	\$ 3,406.00
10/27/2008	5 INCH BULK NOZZLE	1	EACH	\$ 600.00	\$ 600.00
10/27/2008	50 LINEAL FEET OF 4 INCH VAC HOSE	1	EACH	\$ 1,211.00	\$ 1,211.00
10/27/2008	8 INCH HOSE CANISTER TO BLOWER	1	EACH	\$ 860.00	\$ 860.00

①
 ②
 ③
 ④

TOTAL AMOUNT DUE

\$ 16,179.00

SUBCONTRACT NUMBER 1030985

PROGRESS BILLING #8

DATE: 12/31/2008

SUPPLIER: STERLING ENVIRONMENTAL CORPORATION
10203 E STREET
OAKLAND, CA 94603

CONTACT: BRIAN HOPPE
PHONE: 510-638-2800

SEC JOB # 5986

SHIP TO: TETRA TECH EC, INC.
270 NIMITZ (BLDG 270)
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CA 94124

ATTN. MR. BILL DOUGHERTY

BILL TO: TETRA TECH EC, INC.
1230 COLUMBIA ST., SUITE 750
SAN DIEGO, CA 92101

ATTN: ACCOUNTS PAYABLE

VAC LOADER EQUIPMENT RENTAL & CONSUMABLE/DISPOSABLE COSTS

DATE	DESCRIPTION - ITEM	QUANTITY	UNITS	UNIT PRICE	AMOUNT
12/11/2008	MOBILIZATION OF VACUUM SYSTEM	① 1	EACH	\$ 1,700.00	\$ 1,700.00
12/12/2008	VAC LOADER RENTAL	6 ②	DAYS	\$ 600.00	\$ 3,600.00
12/18/2008	6 DAYS				
12/19/2008	DEMOBILIZATION OF VACUUM SYSTEM	③ 1	EACH	\$ 1,000.00	\$ 1,000.00
12/26/2008	5 FILTERS, INCLUDING HEPA'S	1	EACH	\$ 2,602.00	\$ 2,602.00
	100 LINEAL FEET OF 5 INCH VAC HOSE		EACH	\$ 3,406.00	\$ -
	5 INCH BULK NOZZLE	④	EACH	\$ 600.00	\$ -
	50 LINEAL FEET OF 4 INCH VAC HOSE		EACH	\$ 1,211.00	\$ -
12/26/2008	6 INCH HOSE CANISTER TO BLOWER	1	EACH	\$ 645.00	\$ 645.00

TOTAL AMOUNT DUE

price list #

B. H. H. H.

\$ 9,547.00

③



EXHIBIT 6



DEPARTMENT OF THE NAVY
BASE REALIGNMENT AND CLOSURE
PROGRAM MANAGEMENT OFFICE WEST
1455 FRAZEE RD, SUITE 900
SAN DIEGO, CA 92108-4310

Ser BPMOW.CY\0657

JUL 26 2010

Mr. Mark Ripperda
U.S. Environmental Protection Agency
Region IX
75 Hawthorne Street, (SFD 8-1)
San Francisco, CA 94105-3901

Mr. Larry Morgan
California Department of Public Health
1616 Capitol Avenue, MS 7402
P.O. Box 997377
Sacramento, CA 95899-7377

Dear Regulatory Team Members:

The Final, Final Status Survey Results, Building 351A, Hunters Point Shipyard, San Francisco, California is enclosed. The Final FSS and appendices include all data and documentation to support evaluation for unrestricted release of Building 351A. This report also includes the Class I and Class II survey results for the survey units established in the crawl space beneath the building. The RTCs for the Draft version of this FSS report are included as Appendix N.

The Navy requests requisite regulatory review to be completed on the Building 351A Final, Final Status Survey Report and RTCs **no later than Friday, August 27, 2010**. If you have any questions regarding this request and the enclosed document, please contact Mr. Chris Yantos at (619) 532-0912, or Mr. Keith Forman at (619) 532-0913 at your earliest convenience.

Sincerely,

KEITH FORMAN
BRAC Environmental Coordinator
By direction of the Director

Enclosure: (1) Final, Final Status Survey Results, Building 351A, Hunters Point Shipyard,
San Francisco, California, July 2010

JUL 26 2010

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Ser BPMOW.CY\0657

JUL 26 2010

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Mr. Randy Brandt (CD Only)
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Oakland, CA 94612



**Base Realignment and Closure
Program Management Office West
1455 Frazee Road, Suite 900
San Diego, California 92108-4310**

**CONTRACT No N62473-07-D-3211
CTO No. 0018**

**FINAL
FINAL STATUS SURVEY RESULTS
July 26, 2010**

DCN: ECSD-3211-0018-0009

**BUILDING 351A
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA**

Base Realignment and Closure
Program Management Office West
1455 Frazee Road, Suite 900
San Diego, California 92108-4310

CONTRACT NO. N62473-07-D-3211
CTO No. 0018

FINAL
FINAL STATUS SURVEY RESULTS
July 26, 2010

BUILDING 351A
HUNTERS POINT SHIPYARD
SAN FRANCISCO, CALIFORNIA

DCN: ECSD-3211-0018-0009

Prepared by:



TETRA TECH EC, INC.
1230 Columbia Street, Suite 750
San Diego, California 92101-8536



Brian Henderson
Technical Lead



Bill Dougherty
Project Manager



Erik Abkemeier
Radiation Safety Officer



Laurie Lowman
Radiological Affairs Support Office

EXECUTIVE SUMMARY

Building 351A is a vacant, one-story, concrete building constructed over a crawl space that abuts the south end of Building 351. It is located between Cochrane and Morrell Streets within Parcel G at Hunters Point Shipyard in San Francisco, California. Building 351A has approximately 35,166 square feet (3,447.6 square meters) of floor space.

The Historical Radiological Assessment, Volume II (NAVSEA 2004) states that Building 351A was previously used as a radiation detection equipment shop and a facility where other instruments were calibrated, repaired, and reconditioned as needed. The Naval Radiological Defense Laboratory (NRDL) also used Building 351A as a chemistry laboratory.

As defined by the San Francisco Redevelopment Agency, the planned future reuse of the property is as a “mixed use” area that includes residential areas.

Building 351A was considered radiologically impacted because of its use by NRDL personnel and its use as an instrument calibration and repair facility. The radionuclides of concern identified for Building 351A were cesium-137 (^{137}Cs), plutonium-239, radium-226, strontium-90, and thorium-232. These radionuclides cover alpha, beta, and gamma emitters that could be present inside Building 351A.

In March 1955, the NRDL consolidated most of its facilities into Building 815 and surveyed the buildings it formerly used for free release to the shipyard’s use and control. Surveys were conducted in Buildings 313, 313A, 322, 351, 351A, 366 (formerly known as 351B), 506, 507, 508, and 510. The NRDL release letters confirm that these buildings were surveyed and released (with the exception of the drain lines) for unrestricted use in 1955 during the transfer of operations to Building 815. No site-specific survey or decontamination procedure was found for the 1955 NRDL surveys. However, under existing Atomic Energy Commission guidelines, all NRDL buildings were required to be thoroughly surveyed and decontaminated prior to abandonment or release for unrestricted use. For final clearance, former NRDL facilities were required to meet the residual contamination levels established by Navy Bureau of Medicine and Surgery for decontamination of Navy facilities and equipment.

In August 1974, the Department of the Navy (DON) performed additional surveys inside the building and found beta contamination in a sink and associated drain lines in Workroom 47, which was subsequently removed. No additional decontamination efforts were recorded.

The DON performed cursory alpha, beta/gamma, and gamma scans surveys in 1992 as part of a surface contamination radiation survey. No detectable activity was found in the building. In 1997, the DON returned to survey the drain lines in Workroom 47 for removable alpha and beta

activity; however, no residual contamination was detected above acceptable surface contamination activity levels for the period.

In the first quarter of 2001, New World Technology, Inc. (NWT), a radiological contractor to the DON, discovered an area of elevated activity inside one of the laboratory rooms. Tile and molding were removed and analyzed by gamma spectroscopy. In June and July 2001, a 100 percent gamma walkover survey was performed inside the building, and 1-minute static gamma measurements were obtained from the building and from a section of the drain piping from the sink in Workroom 47. Swipes for alpha and beta/gamma removable contamination were obtained from the open ends of the drain line from Workroom 47. Additionally, a 10 percent gamma walkover survey was performed in accessible portions of the attic. No activity above the release criteria was noted in the attic. A small leaded enclosure (a cube about 16 by 16 by 16 inches and small enough to have been used to store higher-activity radioactive materials and sources) was discovered. The enclosure was found to contain loose contamination above the release criteria of this period.

In March 2002, NWT mobilized to perform a Class 3 survey of Building 351A. Elevated readings were again identified in some floor areas. The drain piping was investigated further, found to have contamination, and subsequently removed. All drain pipes from the building drained to a central line located in the crawl space. After all piping was removed from the crawl space area, surveys were performed. Some limited contamination found in the piping and was disposed of as low-level radioactive waste (LLRW).

Following research performed for the Historical Radiological Assessment, the survey was later considered insufficient for the DON to recommend unrestricted release, based on the initial Class 3 classification of the building. In spring 2008, the DON determined that there were areas inside the crawl space that required some remedial actions, the leaded enclosure required removal, and the ventilation system required a scoping survey. The DON directed Tetra Tech EC, Inc. (TtEC) to perform a scoping survey of the ventilation system, and to retrieve the crawl space samples from the sample archive for reanalysis. Additionally, the DON directed TtEC to remove the leaded enclosure for disposal as LLRW by the DON's authorized waste broker.

The search through the sample archive produced all but one of the original samples from 2002. The samples were repackaged and reanalyzed by the on-site laboratory. The missing sample was from the trench area and indicated the presence of elevated ^{137}Cs activity. Because the initial 2002 analysis of the missing sample had indicated elevated ^{137}Cs activity, the DON decided to remediate the affected area.

TtEC performed the ventilation scoping survey, which involved sampling and scanning all ventilation system openings from below. The results of these surveys did not indicate the presence of elevated activity measurements.

In the fall of 2008, TtEC and its subcontractors began to perform the Final Status Survey (FSS), which was designed in accordance with the Multi-Agency Radiation Survey and Site Investigation Manual (NUREG-1575; DoD et al. 2000). To perform the survey, Building 351A was initially divided into 44 Class 1 interior survey units on the main floor, with 17 Class 1 survey units and a single Class 2 survey unit in the crawl space, and a single Class 1 survey unit for the trench area (where the main sewer trunk line was removed). The floors and walls that were less than or equal to 2 meters above the respective floor areas were divided into Class 1 survey units. However, after asbestos abatement and remedial actions were completed, there were 40 Class 1 survey units on the main floor, 19 Class 1 and a single Class 2 survey units in the crawl space, and a single Class 1 survey unit for the trench area.

FSS survey methods for the main floor included fixed static (direct) and scan surface contamination surveys for alpha and beta radiation. Static and scan measurements were performed for gamma radiation. Exposure rate measurements were performed at each discrete static reading location. Additionally, swipe samples were obtained at each discrete static location to evaluate the presence of loose alpha and beta-gamma radiation.

The survey methods in the crawl space included fixed static (direct) and scan measurements for gamma radiation. Exposure rate measurements were performed at each static reading location. Additionally, soil samples were collected and analyzed to evaluate the presence of any of the applicable radionuclides of concern.

Three survey units contained activity above the release criteria. These areas were remediated, and follow-up postremediation remedial action support surveys indicated that the remediation was successful. The FSS activities were then performed in these areas. Additionally, a survey of the floor penetrations from the interior of the building into the crawl space area was performed. No contamination was found.

The survey results were statistically analyzed using the Wilcoxon Rank-Sum test to determine whether residual radioactivity was present and whether conditions within the survey units met the release criteria for unrestricted use. All survey and sample results indicate that Building 351A meets the release criteria and the building can be released for unrestricted use. The doses from these survey units indicated a maximum of 0.732 millirem per year and a maximum excess lifetime cancer risk (increase) of 1.43×10^{-5} (in Survey Unit M) in the crawl space area, and a maximum dose of 0.202 millirem per year with a maximum excess lifetime cancer risk of 1.34×10^{-7} (in Survey Unit 47).

This report details the procedures and results of the surveys performed to facilitate unrestricted release of Building 351A. Based on these results, the DON recommends Building 351A for unrestricted release.

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APPENDICES

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Appendix B	Instrument Calibration Documentation (on CD only)
Appendix C	Final Status Survey Unit Arrangement (on CD only)
Appendix D	Alpha and Beta Measurement Summary (on CD only)
Appendix E	Gamma Measurement Summary (on CD only)
Appendix F	Exposure Rate Measurement Summary (on CD only)
Appendix G	Loose Surface Activity Summary (on CD only)
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Appendix M	Final Task-specific Plan, Building 351A Remedial Action Support and Final Status Survey (on CD only)
Appendix N	Response to Comments

ABBREVIATIONS AND ACRONYMS

^{238}Ac	actinium-228
AEC	Atomic Energy Commission
ALARA	as low as reasonably achievable
AM	Action Memorandum
^{214}Bi	bismuth-214
cm^2	square centimeter
cm/s	centimeters per second
COC	chain of custody
cpm	counts per minute
^{137}Cs	cesium-137
DCGL	derived concentration guideline level
DCGL_{EMC}	DCGL for elevated measurement comparison
DCGL_{W}	wide-area DCGL
DON	Department of the Navy
dpm	disintegrations per minute
DQO	data quality objective
ELCR	excess lifetime cancer risk
EPA	U.S. Environmental Protection Agency
FSS	Final Status Survey
HPS	Hunters Point Shipyard
HRA	Historical Radiological Assessment
keV	kilo-electron volt
LBGR	lower boundary of the gray region
LLRW	low-level radioactive waste
m^2	square meter
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	minimum detectable activity
MDC	minimum detectable concentration
MDCR	minimum detectable count rate
$\text{MDCR}_{\text{SURVEYOR}}$	minimum detectable count rate calculated assuming a surveyor efficiency

ABBREVIATIONS AND ACRONYMS

(Continued)

MDL	method detection limit
MeV	megaelectron volt
mrem/y	millirems per year
NaI	sodium iodide
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
NRDL	Naval Radiological Defense Laboratory
NWT	New World Technology, Inc.
pCi/g	picocuries per gram
²³⁹ Pu	plutonium-239
QA	quality assurance
²²⁶ Ra	radium-226
RASO	Radiological Affairs Support Office
RASS	remedial action support survey
ROC	radionuclide of concern
RPD	relative percent difference
RSO	Radiation Safety Officer
SOP	standard operating procedure
⁹⁰ Sr	strontium-90
TEDE	total effective dose equivalent
²³² Th	thorium-232
²⁰⁸ Tl	thallium-208
TSP	Task-specific Plan
TtEC	Tetra Tech E`C, Inc.
WRS	Wilcoxon Rank-Sum

1.0 SITE DESCRIPTION

1.1 SITE LOCATION AND DESCRIPTION

Building 351A is a vacant, one-story, concrete building constructed over a crawl space that abuts the south end of Building 351. It is located between Cochrane and Morrell Streets within Parcel G at Hunters Point Shipyard (HPS) in San Francisco, California. The building has approximately 35,166 square feet (3,447.6 square meters [m²]) of floor space.

Photograph 1-1 shows a picture of Building 351A.



Photograph 1-1. Building 351A from Southwest Corner Looking North

1.2 PRIOR HISTORICAL USE

According to the Historical Radiological Assessment (HRA), Volume II (NAVSEA 2004), Building 351A was used as a Radiation Detection, Indication and Computation repair facility and electronics shop for radiation detection equipment and a facility for the calibration, repair, and reconditioning of other instruments. The Naval Radiological Defense Laboratory (NRDL) also used Building 351A as a chemistry laboratory, applied research branch, administrative offices, nuclear and physical chemistry laboratory, and chemical technology division. The building remained vacant following HPS closure.

1.3 CURRENT AND FUTURE BUILDING OR LAND USE

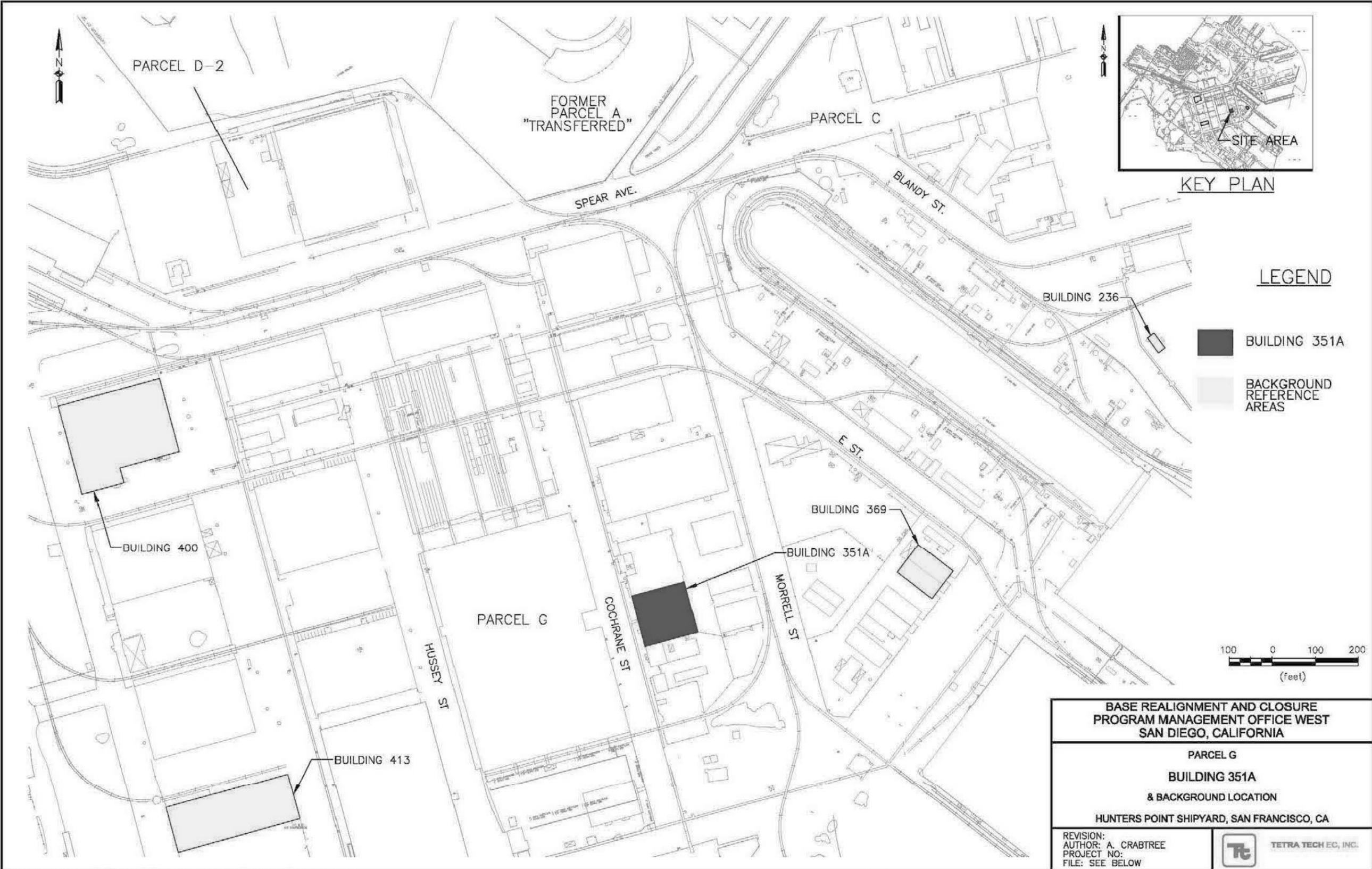
Building 351A is currently vacant. The planned future use of the property identified in the San Francisco Redevelopment Agency Reuse Plan (SFRA 1997) is as a “mixed use” area, which

may include residential areas. Figure 1-1 provides a map of the site location and background reference areas (Buildings 236, 369, 400, and 413).

1.4 REPORT OBJECTIVES

This report details the procedures and results of the surveys performed to facilitate unrestricted release of Building 351A. Appendices A and B provide survey instrumentation data and instrument calibration documentation. Appendix C shows the survey unit arrangement. Appendix D provides the alpha and beta measurement summaries, while Appendices E, F, and G provide the gamma measurement summaries, exposure rate measurements, and loose surface contamination summary sheets, respectively. Appendix H provides the Final Status Survey (FSS) sampling results from the crawl space area, and Appendix I provides the results from statistical tests. Appendix J provides miscellaneous survey results (those not directly involved with the FSS). Appendix K provides work instructions for decontamination efforts inside the building and for using a vacuum system for decontamination in the crawl space area. Appendix L provides the RESRAD and RESRAD-BUILD dose and risk modeling summaries, and Appendix M provides the complete Task-specific Plan (TSP) under which the work was performed. Appendix N presents the Response to Comments on the draft FSS for Building 351A.

**FIGURE 1-1
BUILDING 351A AND REFERENCE AREA LOCATIONS**



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2.0 HISTORICAL SITE ASSESSMENTS

2.1 OPERATING HISTORY

In March 1955, NRDL consolidated most of its facilities into Building 815 and surveyed the buildings it formerly used for free release to the shipyard's use and control. Surveys were conducted in Buildings 313, 313A, 322, 351, 351A, 366 (formerly known as 351B), 506, 507, 508, and 510. The NRDL release letters confirm that these buildings, with the exception of the drain lines, were surveyed and released for unrestricted use in 1955 during the transfer of operations to Building 815. No site-specific survey or decontamination procedure was found for the 1955 NRDL surveys. However, under existing Atomic Energy Commission (AEC) guidelines, all NRDL buildings were required to be thoroughly surveyed and decontaminated prior to abandonment or release for unrestricted use. For final clearance, former NRDL facilities were required to meet the residual contamination levels established by the Naval Bureau of Medicine and Surgery for decontamination of Navy facilities and equipment.

The Department of the Navy (DON) performed additional surveys inside Building 351A in August 1974 and found beta contamination in a sink and associated drain lines in Workroom 47 (in Survey Unit 37 on Figure 4-1) which was subsequently removed. No additional decontamination efforts were recorded.

The DON performed cursory alpha, beta/gamma, and gamma scans surveys in 1992 as part of a surface contamination radiation survey and returned in 1997 to survey the drain lines in Workroom 47 for removable alpha and beta activity. No residual contamination was detected above acceptable surface contamination activity levels for the period during either of these two surveys.

In the first quarter of 2001, New World Technology, Inc. (NWT), a radiological contractor to the DON, discovered an area of elevated activity inside one of the laboratory rooms. Tile and molding were removed and analyzed by gamma spectroscopy. In June and July of 2001, a 100 percent gamma walkover survey was performed inside the building, and 1-minute static gamma measurements were obtained from the building and from a section of the drain piping associated with the sink in Workroom 47. Swipes for alpha and beta/gamma removable contamination were obtained from the open ends of the drain line from Workroom 47. Additionally, a 10 percent gamma walkover survey was performed in accessible portions of the attic. No activity above the release limits of the period was identified in the attic. A leaded enclosure that was not permanently fixed to the building was discovered in Survey Unit 43 (as indicated on Figure 4-1) and found to contain loose alpha and beta contamination above the release criteria of this period. Additional discussion of the leaded enclosure is provided in Section 5.2.1.

In March 2002, NWT mobilized to perform a Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) (NUREG-1575; DOD et al. 2000) Class 3 survey of Building 351A. Elevated readings were again identified in some floor areas. The drain piping was further investigated, found to have contamination, and subsequently removed. All drain pipes from the building drained to a central line located in the crawl space. After all piping was removed from the crawl space area, surveys were performed. Some limited contamination was found in the piping, which was disposed of as low-level radioactive waste (LLRW). After research was performed for the HRA (NAVSEA 2004), the survey was later considered insufficient for the DON to recommend unrestricted release, based on the initial classification of the building.

In spring 2008, the DON determined that there were areas inside the crawl space that required some remedial actions, the leaded enclosure required removal, and the ventilation system required a scoping survey. The DON directed Tetra Tech EC, Inc. (TtEC) to perform a scoping survey of the ventilation system, retrieve the crawl space samples from NWT's archive for reanalysis, perform remediation activities in the crawl space area, and transfer the leaded enclosure to the DON's radiological waste disposal contractor as LLRW.

TtEC's search through NWT's sample archive produced all but one of the original soil samples collected from the crawl space in 2002. The retrieved soil samples were repackaged and reanalyzed by the on-site laboratory. The missing sample collected from the trench area during the 2002 activities had indicated the presence of elevated cesium-137 (^{137}Cs) activity. Because the initial 2002 analysis of the missing sample indicated elevated ^{137}Cs activity, the DON decided to remediate the affected area.

Ventilation surveys by TtEC involved sampling and scanning all ventilation system openings from below. The results of these surveys did not indicate any elevated measurements.

According to the HRA, ^{137}Cs , plutonium-239 (^{239}Pu), radium-226 (^{226}Ra), strontium-90 (^{90}Sr), and thorium-232 (^{232}Th) were the radionuclides of concern (ROCs) for Building 351A.

2.2 MARSSIM CLASSIFICATION

As specified in the HRA (NAVSEA 2004), a remedial action support survey (RASS) and FSS were conducted using guidance presented in the MARSSIM (NUREG-1575; DoD et al. 2000). Sufficient information was collected during the performance of the fieldwork to identify situations that would have required immediate radiological attention or to support development of other project activities.

The primary objectives of the RASS were to:

- Remediate the locations inside the crawl space where the previous survey data indicated elevated 137Cs activity in the trench area and in Survey Unit N (as described in Section 2.2 of the TSP for Building 351A [Appendix M])
- Remove the leaded enclosure, and perform surveys to ensure that there was no spread of contamination to the surrounding area

The primary objectives of the FSS were to:

- Perform a preliminary contamination assessment
- Identify, remove, and dispose of any contaminated materials
- Assess general levels and extent of radionuclide contamination, if found
- Conduct an FSS

Building 351A originally was divided into 44 Class 1 interior survey units, and 3 Class 2 survey units were later added. The floors and walls less than or equal to 2 meters above the respective floor areas in the structure were divided into Class 1 survey units, while the upper portion of the walls and ceiling were considered Class 2 survey units. Class 1 survey units consisted of floor areas less than 100 m². Class 2 survey units consisted of upper walls and the ceiling with a maximum total area of 1,000 m². The TSP for Building 351A (TtEC 2008a), which identifies the original layout of the survey units, is provided in Appendix M.

Following asbestos abatement activities in Building 351A, the survey units were realigned, and survey unit designations 4, 15, 17, and 28 were eliminated when they were combined into adjacent survey units. To perform the FSS, the interior of Building 351A was divided into 40 Class 1 survey units and 3 Class 2 survey units. Table 2-1 provides a summary of each survey unit, the class designation, and associated floor surface areas in m².

The crawl space area was initially divided into 16 Class 1 survey units (Survey Units A through M, O, P, and R) of 100 m² in area, a single Class 2 survey unit (Survey Unit S) around a prospective remediation area, and a Class 1 trench survey unit (Survey Unit T). The trench area had been created when the main sewer trunk line was removed. Following remedial actions, the survey units were realigned into 17 Class 1 survey units (Survey Units A through M, O, P, R, and S) and 1 Class 2 survey unit (Survey Unit U), with a single Class 1 survey unit (Survey Unit T) for the trench area of 53 m². The areas of Survey Units R, S, and U were 90.95, 64.20, and 79.90 m², respectively.

TABLE 2-1

BUILDING 351A INTERIOR SURVEY UNITS

Survey Unit	Area (m ²)	Class
1	14.63	1
2	28.47	1
3	42.87	1
5	57.86	1
6	12.60	1
7	75.22	1
8	26.44	1
9	69.59	1
10	69.65	1
11	24.00	1
12	67.00	1
13	92.34	1
14	44.00	1
16	22.01	1
18	23.30	1
19	52.04	1
20	56.35	1
21	63.64	1
22	54.85	1
23	42.28	1
24	31.38	1
25	49.56	1
26	57.05	1
27	60.70	1
29	16.24	1
30	54.39	1
31	30.13	1
32	94.69	1
33	94.56	1
34	14.46	1
35	22.60	1
36	55.06	1
37	12.52	1
38	13.68	1
39	13.95	1
40	95.61	1
41	43.38	1
42	89.64	1
43	14.93	1
44	14.13	1
45	990.41	2
46	871.58	2
47	826.14	2

Notes:

Survey Units 4, 15, 17, and 28 were eliminated following asbestos abatement activities and combined into adjacent survey units.

Abbreviations and Acronyms:

m² – square meter

2.3 RADIONUCLIDES OF CONCERN AND RADIATION CHARACTERISTICS

As identified in the TSP for Building 351A (TtEC 2008a), the ROCs for Building 351A are ¹³⁷Cs, ²³⁹Pu, ²²⁶Ra, ⁹⁰Sr, and ²³²Th. Table 2-2 lists these ROCs with the half-lives and principal types of radiation (alpha, beta, and gamma).

TABLE 2-2

RADIONUCLIDES OF CONCERN

Radionuclide	Half-life	Radiations
Cesium-137	30 years	Beta/gamma (β , γ)
Plutonium-239	2.41×10^4 years	Alpha (α)/gamma (γ)
Radium-226	1,600 years	Alpha (α)/gamma (γ)
Strontium-90	28.6 years	Beta (β)
Thorium-232	1.4×10^{10} years	Alpha (α)

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3.0 RELEASE CRITERIA

3.1 UNRESTRICTED RELEASE CRITERIA

The Nuclear Regulatory Commission (NRC) and U.S. Environmental Protection Agency (EPA) release limits for unrestricted use were applied in assessing the results of the survey of Building 351A. Results were analyzed to determine if the residual radioactivity, distinguishable from background radiation, resulted in a total effective dose equivalent (TEDE) to an average member of the critical (screening) group exceeding 15 millirems per year (mrem/y) or an excess lifetime cancer risk (ELCR) greater than 10^{-4} , and if the residual radioactivity had been reduced to levels that were as low as reasonably achievable (ALARA). This radiological release process ensures that residual radioactivity will not result in individuals being exposed to unacceptable levels of radiation or radioactive materials.

3.1.1 Unrestricted Release for Building Surfaces

If residual radioactivity is found distributed relatively uniformly across the interior survey units, the unity rule was used to ensure that the total dose or risk meets the release criterion. Dose levels for the critical group were derived by analyzing residual levels of radioactive materials using the unity rule with default decontamination and decommissioning scenarios in RESRAD-BUILD Version 3.5 software, which analyzes the various pathways and scenarios (direct radiation, inhalation, ingestion, etc.) through which exposures could occur. One modification was made to limit the removable fraction to 20 percent instead of 50 percent, as designated in the work planning documents and survey data. The results of this analysis are provided in Section 10.0.

The dose model for the critical group was based on the default decontamination and decommissioning scenario “Building Occupancy” designed by RESRAD-BUILD Version 3.5 software. The default “Building Occupancy” scenario includes external, ingestion, and inhalation exposure pathways. For all contaminants, a nondistributed TEDE scenario was selected for the most conservative approach. For all parameters, the most conservative scenarios were selected and they assume that persons living in the building will be exposed without building-use restrictions.

3.1.2 Unrestricted Release for Crawl Space Area

Dose levels for the critical group were derived by analyzing residual levels of radioactive materials using default decontamination and decommissioning scenarios in RESRAD Version 6.5 software, which analyzes the various pathways and scenarios (direct radiation, inhalation, ingestion, etc.) through which exposures could occur. The results of this analysis are provided in Section 10.0.

The model for the average member of the critical group was based on default RESRAD Version 6.5 parameters. The default residential farmer scenario was used with only three minor changes: 1) the actual surface area of each survey unit was used; 2) the distance of the length parallel to the aquifer was changed; and 3) the net concentrations above background were used. The default parameters include external and inhalation exposures and exposure from the following ingestion pathways: drinking water, food grown with contaminated irrigation water, food grown on contaminated soil, fish, and inadvertent ingestion of soil. Land-based foods considered were leafy vegetables, root vegetables, fruit, grain, beef, poultry, milk, and eggs. Animal feeds include fresh forage, stored grain, and hay. This is the most conservative scenario as it assumes that persons living on the site can use the land for any purpose without land-use restrictions.

3.1.2.1 Surrogate Method for Determining ^{232}Th activity

Due to the time that the DON had suspended operations at HPS, any ^{232}Th present would be in secular equilibrium since activities occurred more than 30 years ago and because the daughter products would have gone through more than seven half-lives. When ^{232}Th is in secular equilibrium, identification by gamma spectroscopy can be achieved. The daughter products of ^{232}Th are actinium-228 (^{228}Ac) and thallium-208 (^{208}Tl), which can be easily identified through gamma spectroscopy. Gamma rays emitted by ^{228}Ac are easy to quantify using gamma spectroscopy and can be used as a surrogate for the members of the thorium series.

The ^{228}Ac activity was reported as the ^{232}Th activity. In the event that the ^{228}Ac activity was greater than the release criterion, the daughter product of ^{208}Tl would have been used to confirm the stated activity since both daughter products would be present. However, no ^{228}Ac activity above the release criterion was identified for the Building 351A crawl space area and trench.

3.2 DERIVED CONCENTRATION GUIDELINES

The radionuclide-specific release criteria, referred to as derived concentration guideline levels (DCGLs), used for the FSS are equivalent to the ROC release criteria established in the final Basewide Radiological Removal Action, Action Memorandum (AM) – Revision 2006 (DON 2006). The DCGLs are presented in terms of surface activity concentrations and refer to average levels of radiation or radioactivity above background levels. The DCGLs applicable to Building 351A and equipment surfaces are expressed in disintegrations per minute (dpm) per 100 square centimeters (cm^2).

3.2.1 Use of DCGLs for Sites with Multiple Radionuclides

Typically, each radionuclide DCGL corresponds to the release criterion (e.g., regulatory limit in terms of dose or risk). However, in the presence of multiple radionuclides, the total of the DCGLs for all radionuclides would exceed the release criterion. In this case, the individual

DCGLs need to be adjusted to account for the presence of multiple radionuclides contributing to the total dose. One method for adjusting the DCGLs includes the use of the unity rule and development of a gross activity DCGL for surface activity to adjust the individual radionuclide DCGLs.

The unity rule, represented in the expression below, is satisfied when radionuclide mixtures yield a combined fractional concentration limit that is less than or equal to 1:

$$\frac{C_1}{DCGL_1} + \frac{C_2}{DCGL_2} + \dots + \frac{C_i}{DCGL_i} \leq 1$$

Where:

C_i = concentration of radionuclide “*i*”
 $DCGL_i$ = DCGL of radionuclide “*i*”

3.2.2 DCGL Modeling

Radionuclide-specific release criteria, referred to as DCGLs, were obtained from the AM and were then modeled using RESRAD-BUILD Version 3.3 (a previous version) based on the 25 mrem/y TEDE or were otherwise risk-based; the final doses using the risk-based release criterion for HPS are all less than this 25 mrem/y release criterion. Following discussions with the EPA and as a matter of policy at HPS, the DON and the Radiological Affairs Support Office (RASO) will also ensure that the resulting dose is less than 15 mrem/y, while maintaining the ELCR below 10^{-4} , prior to recommending a site or building for unrestricted release.

The original model used in the AM for the critical group was based on default RESRAD-BUILD Version 3.3 building occupancy parameters. The default scenario included the following exposure pathways: external, inhalation, deposition, immersion, and ingestion. Modeling with RESRAD-BUILD Version 3.5 shows that with all DCGLs combined, the dose to the average member of the critical group was 19.5 mrem/y when the removable fraction was limited to 20 percent.

The soil release criteria were also obtained from the AM and were then modeled using RESRAD based on the 25 mrem/y TEDE or were otherwise risk-based. The final doses were all less than this 25 mrem/y release criterion. The model for the critical group was based on default RESRAD Version 6.4 parameters. Modeling with RESRAD Version 6.5 shows that with all the DCGLs combined at the maximum survey unit area below the building of 100 m², the dose to the average member of the critical group would be 19.63 mrem/y.

To provide the best possible estimation of dose and risk for the residual activity at Building 351A, the DON used the most current version of RESRAD-BUILD or RESRAD for calculations, as appropriate.

3.2.3 DCGL_w

The wide-area DCGL (DCGL_w) is the average concentration across the site that is equivalent to the release criteria, based on dose or risk. The DCGL_w for each ROC is presented in Table 3-1.

**TABLE 3-1
RELEASE CRITERIA FOR RADIONUCLIDES OF CONCERN**

Radionuclide	Structures Total Surface Activity Release Criteria (dpm/100 cm ²)	Structures Removable Surface Activity Release Criteria (dpm/100 cm ²)	Soils Release Criteria (pCi/g)
Cesium-137	5,000	1,000	0.113
Plutonium-239	100	20	2.59
Radium-226	100	20	1.0 ^a
Strontium-90	1,000	200	0.331
Thorium-232	36.5	7.3	1.69

Notes:

^a Limit is 1 pCi/g above background, per agreement with EPA.

Abbreviations and Acronyms:

cm² – square centimeter

dpm – disintegration per minute

EPA – U.S. Environmental Protection Agency

pCi/g – picocuries per gram

3.3 DIRECT APPLICATION OF DCGLS

In the simplest case, the DCGLs may be applied directly to survey data to demonstrate compliance. This involves assessing the surface activity levels and comparing measured values to the appropriate DCGL.

3.4 INVESTIGATION LEVELS

Investigation levels are specific levels of radioactivity used to indicate when additional investigation may be necessary. Investigation levels also serve as a quality control check. For example, in addition to indicating potential contamination, a measurement that exceeds the investigation level may indicate that the survey unit was improperly classified or may indicate a failing instrument.

When determining an investigation level using a statistically based parameter (e.g., standard deviation), the following may be considered: survey objectives, underlying radionuclide

distributions (e.g., normal, log normal, nonparametric), data population descriptors (e.g., standard deviation, mean, median), and prior survey and historical information.

If an investigation level was exceeded, the measurement would have been confirmed to ensure that the initial measurement/sample actually exceeded the particular investigation level. This would have involved taking further measurements to confirm the initial result and, as appropriate, to quantify the area of elevated residual radioactivity.

3.4.1 Investigation Levels for Alpha and Beta Radiation Surveys

The investigation levels for alpha and beta radiation surveys, which were established at 90 percent of the DCGLs, were 32.85 dpm/100 cm² and 900 dpm/100 cm², respectively.

The alpha and beta loose surface investigation levels were set at 20 percent of the values for total activity. These levels were set at the same values as their DCGL.

3.4.2 Investigation Levels for Gamma Radiation Surveys

The investigation level for gamma radiation surveys was established at the reference area mean + 3 σ , where σ is the standard deviation of the gamma readings in the reference area. It should be noted that there are currently no established release criteria for building interior surfaces based on gamma radiation readings alone (since ¹³⁷Cs is also detectable by beta emission).

Gamma surveys of building interior surfaces were performed as an added measure to help detect any anomalies, such as gamma-emitting sources that may not emit alpha or beta radiation.

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4.0 SURVEY DESIGN

4.1 OBJECTIVE OF SURVEYS

MARSSIM (NUREG-1575; DoD et al. 2000), NUREG-1505 (NRC 1998), and NUREG/CR-1507 (NRC 1997) were used as guidance in designing and conducting the surveys referenced in this report. The surveys were also performed consistently with the requirements outlined in the final Base-wide Radiological Work Plan Revision 1 (Base-wide Plan Revision 1) (TtEC 2007).

The objective of the surveys discussed in this report is to demonstrate that residual radioactivity levels are less than the predetermined release criteria for the ROCs. In demonstrating that the objective has been met, the null hypothesis (H_0) is tested for residual contamination exceeding the release criterion. The alternative hypothesis (H_a) is then tested for residual contamination that meets the release criterion.

4.2 SURVEY UNITS

Initially, the floors and walls less than or equal to 2 meters above the respective floor areas were divided into 44 Class 1 survey units (less than 100 m² of floor area each). Following asbestos abatement activities, the survey units were realigned and only 40 survey units remained. Survey Units 4, 15, 17, and 28 were eliminated, and the associated floor areas were combined with the adjacent survey units. Three Class 2 survey units were also established for upper walls and ceilings greater than 2 meters above the respective floor surfaces. The crawl space was divided into 24 Class 1 survey units, including the trench area, and a single Class 2 survey unit (buffering a remedial action in the area of Survey Unit N).

The planned arrangement of the Class 1 and 2 interior survey units and the original layout and sampling pattern in the crawl space area are shown in Appendix M. The actual arrangement of each interior survey unit in the building following asbestos abatement activities is shown in Appendix C. The general arrangement of the interior survey units is shown on Figure 4-1, and the crawl space survey units are shown on Figure 4-2.

4.3 REFERENCE AREAS

Certain radionuclides may occur at significant levels as part of background in the media of interest (in this case, building material). Examples include members of the naturally occurring uranium, thorium, and actinium series. As a result of nuclear weapons fallout, ¹³⁷Cs and other radionuclides are also present in background (Wallo et al. 1994). Establishing background concentrations that describe a distribution of measurement data is necessary to identify and evaluate contributions attributable to site operations. Determining background levels for

comparison with the conditions determined in specific survey units entails conducting surveys in one or more reference areas to define the radiological conditions of the site.

A site background reference area should have similar physical, chemical, geological, radiological, and biological characteristics as the survey unit being evaluated. Background reference areas are normally selected from non-impacted areas, but are not limited to natural areas undisturbed by human activities. In some situations, a reference area may be associated with the survey unit being evaluated, but cannot be potentially contaminated by site activities. Reference areas provide a location for background measurements, which are used for comparison with survey unit data. Ideally, the radioactivity present in a reference area would be the same as the radioactivity present in the survey unit had it never been contaminated.

After reviewing the applicable plans and variety of interior surfaces in Building 351A, various buildings were identified as background reference areas due to the different construction materials. Buildings 236, 369, 400, and 413 were selected for use as the background or reference areas for the Building 351A survey activities. Figure 1-1 shows the locations of these reference buildings at HPS. These buildings had similar construction materials to Building 351A and were not listed as impacted in the HRA (NAVSEA 2004).

The reference area for soils was the same as the reference area used for the on-going sewer and storm drain removal project. Reference area soil samples were obtained in April 2006 in an area of the Building 813 parking lot in Parcel D-2. Building 813 was identified in the HRA as being impacted, although the parking lot area was not identified as being impacted and is considered of like material to that encountered in the soils in survey units in the crawl space area.

Eighteen samples were collected systematically from Building 813 parking area for reference area purposes. All 18 samples were analyzed at the on-site laboratory by gamma spectroscopy. In addition, 10 percent of the samples (two samples total) were analyzed for ^{90}Sr and ^{239}Pu at the on-site laboratory. The reference area samples provided a basis for net activity concentration. Background activity for ^{226}Ra was determined to be 0.485 picocurie per gram (pCi/g), placing the release criteria at 1.485 pCi/g of ^{226}Ra . The reference area gamma spectroscopy, ^{90}Sr , and ^{239}Pu results are provided in Appendix H.

4.4 STATISTICAL TESTS

MARSSIM (NUREG-1575; DoD et al. 2000) recommends use, in part, of the Wilcoxon Rank-Sum (WRS) test to conservatively evaluate field results. The WRS test is a two-sample, nonparametric procedure that can be used to evaluate compliance when contamination is present in background. The WRS test can be used to compare means between samples (contamination concentration measured in reference background materials versus the same parameter measured

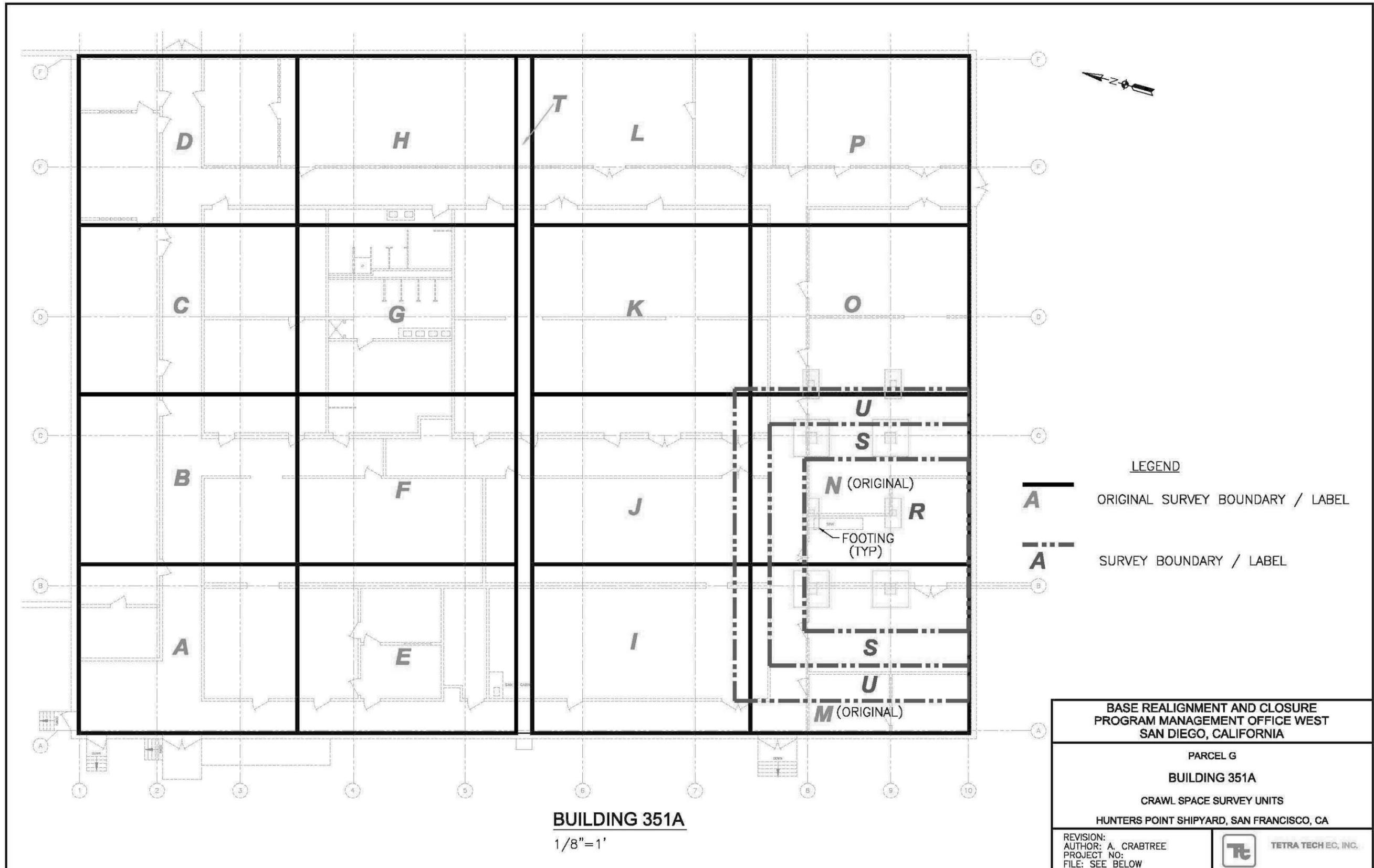
**FIGURE 4-1
FIRST FLOOR CLASS 1 SURVEY UNIT ARRANGEMENT**



Note:
Survey Units 4, 15, 17, and 28 were eliminated and the floor area combined into adjacent survey units.

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**FIGURE 4-2
CRAWL SPACE SURVEY UNIT ARRANGEMENT**



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in site investigative materials) when either or both sampling distributions deviate significantly from normal.

During the collection of associated data, a verification and validation process was incorporated to evaluate whether the data met the objectives of the survey and whether the data were sufficient to determine compliance. Data collected from each survey unit were independently subjected to the following reviews:

- 1) Collected data were compared with the prescribed activities documented according to the applicable Standard Operating Procedures (SOPs) for HPS.
- 2) Collected data were compared to the data quality objectives (DQOs) documented in the final TSP for Building 351A (TtEC 2008a) as provided in Appendix M.
- 3) A supervisor, not directly involved in the data collection process, conducted an independent technical review of the information at the end of each surveillance step.

This process ensured the validity of collected data, the measurement techniques used, and consistency in surveillance data collection.

4.5 DETERMINING THE NUMBER OF MEASUREMENTS AND/OR SAMPLES

Since radionuclide-specific measurements were not performed, N , the number of samples, was calculated in the manner specified for the WRS test using Equation 5-2 from the Base-wide Plan Revision 1 (TtEC 2007):

Equation 5-2 from the Base-wide Plan Revision 1

$$N = \left\{ \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{3(P_r - 0.5)^2} \right\} (1.2)$$

Where:

- $Z_{1-\alpha}$ = Type I decision error level as determined from MARSSIM
- $Z_{1-\beta}$ = Type II decision error level as determined from MARSSIM
- P_r = random measurement probability, which is based on relative shift discussed in Section 4.5.4
- 1.2 = factor for oversampling to account for missing or unusable data

The second term in the equation increases the number of data points by 20 percent. The value of 20 percent was selected to account for a reasonable amount of uncertainty in the parameters used to calculate N and still allow flexibility to account for some lost or unusable data. While this 20 percent factor assists in meeting all DQOs, it is not required during the data quality assessment to demonstrate compliance with the stated objectives of the statistical tests.

P_r in Equation 5-2 from the Base-wide Plan Revision 1 (TtEC 2007) above is based on the relative shift. The relative shift is equal to Δ/σ , where Δ is equal to [DCGL-lower boundary of the gray region (LBGR)] and σ is an estimate of the standard deviation of the measured values in a survey unit.

In the example calculations presented in the following sections, the data from Class 1 Survey Unit 6 were used. Alpha measurements were assumed to be from ^{239}Pu , ^{226}Ra , and ^{232}Th while beta measurements were assumed to be from ^{137}Cs and ^{90}Sr .

4.5.1 Use of the Unity Rule for Sites with Multiple Radionuclides

The unity rule should be used to determine that the sum of each radionuclide concentration divided by its DCGL is less than or equal to 1. Represented in the equation below, using the mean alpha and beta concentrations from each survey unit (when greater than zero, which the alpha data were not), it can be shown that the unity rule is satisfied (using Survey Unit 6 data):

$$\frac{241.63 \text{ dpm}/100 \text{ cm}^2}{5,000 \text{ dpm}/100 \text{ cm}^2} + \frac{241.63 \text{ dpm}/100 \text{ cm}^2}{1,000 \text{ dpm}/100 \text{ cm}^2} = 0.290$$

4.5.2 LBGR Determination

The LBGR is the net median concentration of the contaminant in the survey unit. Since this value is unknown, MARSSIM (NUREG-1575; DoD et al. 2000) suggests using a value for the LBGR of one-half the DCGL for planning purposes. However, once the median concentration activity in the survey unit was established (as expressed in a gross alpha and gross beta measurement), this value was used as a ratio to the lowest DCGL for the decay method to determine the LBGR. Equation 6-7 from the Base-wide Plan Revision 1 (TtEC 2007) gives the method used to determine the LBGR:

Equation 6-7 from the Base-wide Plan Revision 1

$$\text{weighted - sum} = \frac{C_1}{DCGL_1} + \frac{C_2}{DCGL_2} + \frac{C_3}{DCGL_3} + \dots + \frac{C_i}{DCGL_i}$$

Where:

C_i = concentration of radionuclide “ i ”
 $DCGL_i$ = DCGL of radionuclide “ i ”

Gross alpha activity will assume the concentration was due to both ^{226}Ra and ^{232}Th , while gross beta activity will assume the concentration was due to both ^{90}Sr and ^{137}Cs . In the cases where the net median concentration of both the alpha and beta was less than zero, the LBGR was also

set at zero. In the event of alpha or beta activity less than zero, the activity used in calculations was set at zero.

For Survey Unit 6, the net median concentrations of alpha and beta activities were -2.30 dpm/100 cm² (which was not used since it was less than zero) and 261.27 dpm/100 cm², respectively. Substituting:

$$\frac{261.27 \text{ dpm}/100 \text{ cm}^2}{5,000 \text{ dpm}/100 \text{ cm}^2} + \frac{261.27 \text{ dpm}/100 \text{ cm}^2}{1,000 \text{ dpm}/100 \text{ cm}^2} = 0.314$$

4.5.3 Standard Deviation

Likewise, there is no estimate of the standard deviation of the contaminant in the survey unit, especially if no contaminant is initially expected. Therefore, σ is assigned the value of the standard deviation of the adjusted measurement values in the survey unit as shown in Equation 6-8 from the Base-wide Plan Revision 1 (TtEC 2007), whichever is higher; these data are provided in the corresponding WRS test data:

Equation 6-8 from the Base-wide Plan Revision 1

$$\sigma = \sqrt{\left(\frac{\sigma_{C1}}{DCGL_1}\right)^2 + \left(\frac{\sigma_{C2}}{DCGL_2}\right)^2 + \dots + \left(\frac{\sigma_{Ci}}{DCGL_i}\right)^2}$$

Where:

σ_{Ci} = standard deviation from radionuclide “i”
 $DCGL_i$ = DCGL of radionuclide “i”

As an example, from Survey Unit 6, the alpha measurement standard deviation observed was 4.61 dpm/100 cm², while the beta measurement standard deviation observed was 144.31 dpm/100 cm². When using the DCGLs specified in Table 3-1, the standard deviation of the survey unit can be determined as shown below:

$$\sigma = \sqrt{\left(\frac{144.31 \text{ dpm}/100 \text{ cm}^2}{5,000 \text{ dpm}/100 \text{ cm}^2}\right)^2 + \left(\frac{4.61 \text{ dpm}/100 \text{ cm}^2}{100 \text{ dpm}/100 \text{ cm}^2}\right)^2 + \left(\frac{144.31 \text{ dpm}/100 \text{ cm}^2}{1,000 \text{ dpm}/100 \text{ cm}^2}\right)^2 + \left(\frac{4.61 \text{ dpm}/100 \text{ cm}^2}{100 \text{ dpm}/100 \text{ cm}^2}\right)^2 + \left(\frac{4.61 \text{ dpm}/100 \text{ cm}^2}{36.5 \text{ dpm}/100 \text{ cm}^2}\right)^2}$$

$\sigma = 0.205$

4.5.4 Relative Shift

The relative shift is equal to Δ/σ , where Δ is equal to [DCGL-LBGR] and σ is an estimate of the standard deviation of the measured values in a survey unit.

The relative shift from Survey Unit 6 can be calculated as shown below in Equation 5-1 from the Base-wide Plan Revision 1 (TtEC 2007):

Equation 5-1 from the Base-wide Plan Revision 1

$$\frac{\Delta}{\sigma} = \frac{DCGL_w - LBGR}{\sigma}$$

Using the Survey Unit 6 data:

$$\frac{\Delta}{\sigma} = \frac{DCGL_w - LBGR}{\sigma} = \frac{1 - 0.314}{0.205} = 3.36$$

Using this Δ/σ value of 3.36, from Table 5.1 of MARSSIM, P_r was determined to be 0.983039.

4.5.5 Unity Rule

As stated in Section 4.3.3 and Appendix I.11 of MARSSIM, the unity rule was used since multiple radionuclides (with different decay methods) were present. As stated in Appendix I.11.1, the DCGL is set at 1.0 (the total fraction of all radionuclides might exceed the release criteria as stated in the AM).

Therefore, N is calculated using Equation 5-2 from the Base-wide Plan Revision 1 (TtEC 2007) as follows:

Where:

Type I decision error level = 1.645

Type II decision error level = 1.645

Random measurement probability for Survey Unit 1 = 0.983039

$$15.46 = \left\{ \frac{(1.645 + 1.645)^2}{3(0.983039 - 0.5)^2} \right\}$$

N for surveys is calculated as a minimum of 15.46 total data collection locations. Rounding this value up to the nearest even number, this would equate to a minimum of 8 from the survey unit and 8 from the reference area, for a total of 16.

Designated as an FSS, the survey was designed so that if no radioactive contamination was found above established DCGLs, this survey would be used as an FSS, in accordance with MARSSIM (NUREG-1575; DoD et al. 2000). To maintain the designation for an FSS, data were continuously analyzed to determine the relationship between each survey unit and the reference area.

While reviewing the data sets, N calculated for the Class 1 Survey Units 5, 19, 25, 26, 32, 35, and 36 indicated that more than 20 systematic measurements were needed for the statistical tests. A new diagram for each of these survey units was generated with 26 systematic data point locations to ensure that enough measurements would be collected. The original survey is included with the revised data set in Appendices D and E. In all instances, once the additional data were collected, the number of required measurements decreased.

Table 4-1 provides the data used to calculate N for each interior survey unit.

4.5.6 Elevated Measurement Comparison

According to MARSSIM (NUREG-1575; DoD et al. 2000), systematic measurements and sampling, in conjunction with surface scanning, are used to obtain adequate assurance that small areas of elevated radioactivity will still satisfy the release criterion for small areas.

The $DCGL_W$ is the average concentration across the survey unit that is equivalent to the release criteria, based on dose or risk. The general assumption is that the concentrations of the radionuclides in the source are homogeneous. The degree to which any single localized area can be elevated above the average, assuming the average is at the $DCGL_W$, and not invalidate the homogeneous assumption is characterized by the small area criteria ($DCGL$ for elevated measurement comparison [$DCGL_{EMC}$]).

However, in survey units where the scan minimum detectable concentration (MDC) was less than the $DCGL_W$, because the $DCGL_W$ is always strictly less than the $DCGL_{EMC}$, no further elevated measurement comparison was performed in these survey units. The maximum scan MDC was less than 50 percent of the $DCGL_W$ in interior survey units.

RESRAD and area factor calculations recommended per MARSSIM for individual radionuclide $DCGL_{EMC}$ s indicate an inordinate required sampling density in the crawl space areas (i.e., greater than 1 sample per m^2). MARSSIM Section 5.5.2.4 states: *“When the detection limit of the scanning technique is very large relative to the $DCGL_{EMC}$, the number of measurements estimated to demonstrate compliance using the statistical tests may become unreasonably large. In this situation perform an evaluation of the survey objectives and considerations. These considerations may include the survey design and measurement methodology, exposure pathway modeling assumptions and parameter values used to determine the DCGLs, Historical Site Assessment conclusions concerning source terms and radionuclide distributions, and the results of scoping and characterization surveys. In most cases the result of this evaluation is not expected to justify an unreasonably large number of measurements.”* Because the default parameters used in the RESRAD modeling are extremely conservative, they are not likely to be representative of a “real life” scenario (i.e., it is difficult to spend a significant portion of one’s life on a $1\text{-}m^2$ section of land, and grow a significant number of crops for individual sustenance in a crawl space on a $1\text{-}m^2$ section of land.) The DON selected a sampling density of 20 samples

per 100 m², for a maximum hot spot area of 5 m², as RESRAD modeling at the scan MDC for the ROC yielding the largest dose was less than 15 mrem in a year. If the building had been demolished, and the area were to be sampled in accordance with the HPS Base-wide Sanitary Sewer and Storm Drain Removal Work Plan, the sampling density would have been such that 18 samples were collected in a 1,000-m² area. The 20 samples per 100 m² sample density provides greater than a factor of 10 sample coverage in this case as compared to an “outdoor” sampling scenario.

TABLE 4-1

CALCULATION OF NUMBER OF SAMPLES REQUIRED FOR STATISTICAL TESTS

Survey Unit	Area (m ²)	Class	Alpha Mean (dpm _{NET} /100 cm ²)	Alpha Standard Deviation (dpm/100 cm ²)	Alpha Median (dpm _{NET} /100 cm ²)	Beta Mean (dpm _{NET} /100 cm ²)	Beta Standard Deviation (dpm/100 cm ²)	Beta Median (dpm _{NET} /100 cm ²)	LBGR	Standard Deviation (Unity)	Relative Shift (Δ/σ)	P _r (MARSSIM Table 5.1)	N Required (Survey Unit)	N Taken (Survey Unit)
1	14.63	1	-1.17	5.61	-0.45	-142.50	225.81	-123.88	0.000	0.288	3.47	0.983039	8	20
2	28.47	1	-3.40	3.37	-4.14	67.56	162.32	115.95	0.139	0.195	4.40	1.000000	8	20
3	42.87	1	-3.10	4.91	-1.77	-8.68	103.15	-11.98	0.000	0.184	5.42	1.000000	8	20
5	57.86	1	-9.71	3.87	-10.11	-57.37	106.14	-63.00	0.000	0.161	6.21	1.000000	8	26
6	12.60	1	-2.30	4.61	-2.30	241.63	144.31	261.27	0.314	0.205	3.36	0.983039	8	20
7	75.22	1	-0.91	3.14	-1.41	29.10	78.63	27.84	0.033	0.126	7.69	1.000000	8	20
8	26.44	1	-2.58	4.75	-3.22	48.16	135.26	101.26	0.122	0.201	4.37	1.000000	8	20
9	69.59	1	0.18	6.63	0.45	-112.29	245.82	-80.82	0.021	0.323	3.03	0.983039	8	20
10	69.65	1	-1.53	6.02	-1.35	-111.36	216.16	-38.42	0.000	0.288	3.47	0.983039	8	20
11	24.00	1	-4.05	4.07	-2.30	-15.54	159.15	-68.02	0.000	0.205	4.87	1.000000	8	20
12	67.00	1	-1.68	5.82	-0.89	-17.19	94.91	-28.51	0.000	0.204	4.90	1.000000	8	20
13	92.34	1	-4.05	4.20	-5.06	-80.16	156.41	-91.98	0.000	0.205	4.87	1.000000	8	20
14	44.00	1	-2.79	3.96	-4.05	-134.88	282.67	-307.39	0.000	0.313	3.19	0.983039	8	20
16	22.01	1	-2.61	5.49	-2.25	-214.71	187.95	-294.14	0.000	0.256	3.91	0.993329	8	20
18	23.30	1	-1.29	7.13	-2.30	76.52	217.99	-30.15	0.000	0.313	3.20	0.983039	8	20
19	52.04	1	-3.34	3.73	-2.66	-154.23	100.90	-152.45	0.000	0.154	6.48	1.000000	8	26
20	56.35	1	-4.16	3.26	-3.54	-133.28	87.82	-127.66	0.000	0.135	7.43	1.000000	8	20
21	63.64	1	-5.52	4.58	-5.98	-111.93	128.65	-168.51	0.000	0.193	5.19	1.000000	8	20
22	54.85	1	-3.40	5.57	-4.14	54.73	165.36	122.13	0.147	0.241	3.55	0.993329	8	20
23	42.28	1	-1.75	5.71	-3.22	45.61	163.68	-4.64	0.000	0.243	4.12	1.000000	8	20
24	31.38	1	-3.81	5.24	-4.43	-169.89	118.82	-188.81	0.000	0.202	4.95	1.000000	8	20
25	49.56	1	-2.52	5.85	-1.77	-127.53	86.03	-97.92	0.000	0.201	4.99	1.000000	8	26
26	57.05	1	-7.81	4.39	-7.47	13.18	93.18	40.47	0.049	0.165	5.75	1.000000	8	26
27	60.70	1	-2.39	5.29	-3.22	83.64	180.29	166.19	0.199	0.246	3.26	0.983039	8	20
29	16.24	1	-3.28	4.23	-4.43	-95.68	106.04	-130.97	0.000	0.169	5.90	1.000000	8	20
30	54.39	1	-2.21	5.51	-2.66	-75.44	111.40	-82.22	0.000	0.204	4.89	1.000000	8	20
31	30.13	1	-2.12	5.29	-1.38	30.07	149.83	27.05	0.032	0.223	4.33	1.000000	8	20
32	94.69	1	-3.00	3.84	-3.54	-93.66	90.50	-70.65	0.000	0.150	6.66	1.000000	8	26
33	94.56	1	-1.95	5.91	-4.43	-53.63	102.36	-69.82	0.000	0.210	4.76	1.000000	8	20
34	14.46	1	-1.10	6.84	-2.30	82.86	210.21	88.12	0.106	0.301	2.97	0.974067	9	20
35	22.60	1	-2.39	6.63	-2.30	11.29	166.56	-57.20	0.000	0.266	3.76	0.993329	8	26
36	55.06	1	-8.62	6.03	-10.99	42.80	125.77	41.88	0.050	0.226	4.20	1.000000	8	26
37	12.52	1	-4.09	5.15	-5.31	-191.67	87.32	-197.90	0.000	0.182	5.49	1.000000	8	20
38	13.68	1	-2.61	5.37	-3.15	-157.14	285.28	-331.24	0.000	0.335	2.99	0.974067	9	20
39	13.95	1	-1.89	4.47	-2.25	-191.52	275.56	-325.94	0.000	0.313	3.19	0.983039	8	20
40	95.61	1	-2.57	5.22	-2.66	-26.69	97.17	-8.68	0.000	0.189	5.29	1.000000	8	20
41	43.38	1	1.10	8.37	-0.46	41.59	155.96	96.62	0.116	0.303	2.92	0.974067	9	20
42	89.64	1	-4.50	6.28	-5.84	-340.65	189.21	-404.11	0.000	0.273	3.66	0.993329	8	20
43	14.93	1	-1.49	3.01	-1.41	-164.07	201.66	-277.12	0.000	0.226	4.43	1.000000	8	20
44	14.13	1	-3.98	5.32	-5.31	-35.37	106.80	-58.25	0.000	0.197	5.08	1.000000	8	20
45	990.41	2	-0.42	5.63	0.17	-68.91	137.25	-63.69	0.008	0.223	4.45	1.000000	8	20
46	871.58	2	-4.54	4.99	-4.88	-25.14	81.22	-28.91	0.000	0.175	5.72	1.000000	8	20
47	826.14	2	-2.02	5.06	-1.51	400.29	155.87	369.63	0.444	0.223	2.50	0.944167	10	20

Abbreviations and Acronyms:
 cm² – square centimeter
 dpm – disintegrations per minute
 dpm_{NET} – net disintegrations per minute

LBGR – lower boundary of the gray region
 m² – square meter
 MARSSIM – Multi-Agency Radiation Survey and Site Investigation Manual

N – number
 P_r – random measurement probability

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5.0 FIELD ACTIVITIES

In the summer of 2008, TtEC and its subcontractors mobilized to perform activities associated with the Building 351A FSS. This section describes the field reconnaissance, remedial actions in the crawl space, and surveys that were ancillary to the Building 351A FSS. The FSS is discussed in other sections of this report.

5.1 MOBILIZATION

Mobilization to perform the FSS work of Building 351A began in mid-May 2008. The TSP for Building 351A (TtEC 2008a), as provided in Appendix M, was reviewed by TtEC and NWT staff involved in the FSS, and instrumentation and supplies were procured. Equipment used in Building 351A was surveyed upon arrival at HPS prior to use in Building 351A, until the equipment was verified to be clear of radioactive contamination. Regulatory Guide 1.86 limits (AEC 1974) specified for ^{137}Cs , ^{239}Pu , ^{226}Ra , ^{90}Sr , and ^{232}Th were used for clearance of equipment.

5.2 INITIAL ACTIVITIES

Work activities began with a building walkthrough conducted by TtEC health and safety personnel accompanied by health physics professionals. The walkthrough was performed to ensure that personnel working inside the building would not encounter any unsafe situations, determine the amount of trash/debris to be removed for proper disposal, and inspect any equipment and materials to be surveyed prior to release.

Trash and debris were collected from inside Building 351A in an effort to remove all non-permanent items from the building before the survey activities were performed. The trash/debris included miscellaneous items that would be considered rubbish, such as ceiling tiles, and wood paneling, which were disposed of as LLRW in accordance with Section 2.1 of the TSP for Building 351A (TtEC 2008a).

5.2.1 Removal of Leaded Enclosure from Room 25

The leaded enclosure, which had previously been identified as LLRW based on removable contamination survey activities, was removed from Room 25 (located in the southwest corner of the building) in Building 351A. Survey activities performed on the leaded enclosure included a 100 percent surface scan, static measurements, and the collection of swipe samples. The results of the survey activities showed 4,000 dpm/100 cm² alpha and 12,000 dpm/100 cm² beta activity. The survey report is provided in Appendix J. The leaded enclosure was transferred to the DON's LLRW contractor for disposal.

5.2.2 Asbestos Abatement Activities

Flooring materials (tiles) and wallboard in Building 351A were evaluated by a qualified asbestos abatement contractor and found to contain potentially friable asbestos. The purpose of the asbestos abatement activities was to expose the original surfaces of the building in preparation for the survey activities. The asbestos contractor performed the abatement activities and the asbestos-containing materials were disposed of as LLRW in accordance with Section 2.1 of the TSP for Building 351A (TtEC 2008a).

5.2.3 Ventilation System

As discussed in Section 1.2 of the TSP for Building 351A (TtEC 2008a), TtEC performed a scoping survey on the ventilation system to determine whether the system was impacted. All accessible portions of the system (including registers and cold-air returns) were opened, and the interior portions of the system were surveyed. Because insufficient materials were present, no solid samples were collected. Swipe samples were collected at every accessible location and were analyzed by gamma spectroscopy.

The results of the scoping survey did not indicate the presence of activity greater than the release criteria. The survey results are presented in Appendix C of the TSP for Building 351A (provided in Appendix M). The scoping survey includes a photograph of each survey point and the corresponding results. Following an evaluation of the scoping survey results, the DON determined that the ventilation system in Building 351A was non-impacted.

5.2.4 Crawl Space Remedial Actions

The RASO directed the reanalysis of the crawl space soil samples collected by NWT in 2002. The results of the original analyses and the results of the reanalyzed samples are provided in Appendix J. One of the previously collected soil samples (Bldg351AT-16) that had indicated the presence of ^{137}Cs activity above the release criteria could not be found in the archives. Based on the results of the analyses and sample Bldg351AT-16, remedial actions in the crawl space area were performed in the trench area (Survey Unit T) and in Survey Unit N as discussed in Section 2.2 of the TSP (TtEC 2008a).

A work instruction was prepared to remediate each area using a soil-vacuum system (Appendix K). The vacuum system was equipped with a high-efficiency particulate air filter as detailed in the work instruction. Air sampling results did not indicate activity above 10 percent of the derived air concentration levels. The locations of each remediation can be seen in Appendix C. The remediation sample results are provided in Appendix H, and the final systematic sample results are provided in Appendix J.

After remediation, no crawl space survey units were backfilled.

5.2.4.1 Survey Unit T (Trench)

The trench designated as Survey Unit T in the crawl space was the result of the historical drain line removal activities. Initial (2002) and recount (2008) sample analytical results indicated ^{137}Cs activity near Sample Point 16. Based on the sample analytical results, the area was remediated in a 1-foot lift, and six postremediation samples were collected (samples 17 to 22). No activity above the release criteria was identified in the postremediation samples. Systematic samples were then collected (samples 23 to 40) and submitted to the on-site laboratory for analysis. The results indicated the presence of ^{137}Cs activity above the release criterion in Sample Point 38 (0.16997 pCi/g) and Sample Point 40 (0.49228 pCi/g). The elevated activity locations were within the general area of the original remediation activities.

The area was again remediated in a 1-foot lift, and six postremediation samples were collected (samples 41 to 46) and submitted to the on-site laboratory for analysis. The analytical results did not identify the presence of elevated activity in the postremediation samples. Systematic soil sample (samples 47 to 64) were collected over the entire trench area and submitted to the on-site laboratory for analysis. No activity above the release criteria was identified. Because the trench was located beneath Building 351A, it was not backfilled. Analytical results for samples 17 to 46 are provided in Appendix J, and the final systematic sample results are provided in Appendix H.

After all remedial actions had been completed, a total of 11.5 cubic yards of material was removed and disposed of as LLRW.

5.2.4.2 Survey Unit N

As discussed in Section 2.2.2 of the TSP for Building 351A (TtEC 2008a), sample N-09 exceeded the release criterion for ^{137}Cs . The area around Bldg351AN-09 (N-09) was fully characterized (samples 72AB351A-275 to 72AB351A-289). Samples 275 (0.18564 pCi/g), 276 (0.24637 pCi/g), 277 (0.53634 pCi/g), 281 (0.55054 pCi/g), 282 (1.9930 pCi/g), and 285 (0.40662 pCi/g) exceeded the ^{137}Cs release criterion.

Remediation was performed in the designated area (Appendix J), and 11 postremediation samples (72AB351A-296 to 306) were collected and analyzed. The analytical results did not indicate the presence of activity above the release criteria. The sample results and maps from this evolution can be found in Appendix J.

After all remedial actions had been completed, a total of 15 cubic yards of material was removed and disposed of as LLRW.

5.2.4.3 Survey Units R and S

After no contamination was identified in the postremediation samples from Survey Unit N, two new survey units were established. Survey Unit R was established as a Class 1 survey unit, and

Survey Unit S was established as a Class 2 area extending 2 meters beyond the boundary of Survey Unit R. A total of 20 systematic soil samples were collected from each of the survey units and were submitted to the on-site laboratory for analysis. The laboratory results indicated the presence of ^{137}Cs activity in Survey Unit R, sample 7, at 0.32981 pCi/g and the presence of ^{226}Ra activity in Survey Unit S, sample 11, at 2.2309 pCi/g. Based on this result, Survey Unit S was converted to a Class 1 survey area.

A total of 18 additional characterization samples (samples 21 to 38) were collected from Survey Unit R and analyzed by the on-site laboratory. Samples 33 and 34 were collected at depths of 1 foot and 2 feet below ground surface, respectively, to determine whether ^{137}Cs contamination extended below the surface. The laboratory results indicated the presence of ^{137}Cs activity above the release criterion in sample 29 at 0.19145 pCi/g and sample 31 at 0.24148 pCi/g.

A total of six additional characterization soil samples (samples 21 to 26) were collected from Survey Unit S and analyzed by the on-site laboratory. None of the characterization sample results exceeded the release criteria.

An additional 1 foot of soil was removed in the immediate vicinity of Survey Units S and R as indicated in Appendix J. Postremediation soil samples were collected and analyzed. None of the postremediation sample results from Survey Unit R (samples 39 to 56) or Survey Unit S (samples 27 to 33) indicated the presence of activity above the release criteria.

A total of 20 systematic soil samples were collected from both Survey Unit R (samples 57 to 76) and Survey Unit S (samples 34 to 53) and analyzed by the on-site laboratory. None of these sample analytical results exceeded the release criteria. The final systematic sample results are provided in Appendix H, while the characterization and postremediation sampling results are provided in Appendix J.

After all remedial actions had been completed, a total of 1.5 cubic yards of material was removed from Survey Unit R and 0.5 cubic yard of material was removed from Survey Unit S. All remediation spoils were disposed of as LLRW.

5.2.4.4 Survey Unit U

Following the remediation and systematic sampling activities in Survey Units R and S, a new Class 2 area, designated as Survey Unit U, was established 2 meters beyond the boundaries of Survey Unit S. A total of 20 systematic soil samples were collected from Survey Unit U and submitted to the on-site laboratory for analysis. No activity above the release criteria was identified in the systematic samples. These results are provided in Appendix H. The general arrangement of Survey Unit U relative to Survey Units R and S is shown on Figure 4-2.

5.3 GRIDDING ACTIVITIES

After approval of the TSP for Building 351A (TtEC 2008a), the interior and crawl space areas were gridded out using the preliminary diagrams. The initial survey unit design was then modified to allow for better survey unit placement following asbestos abatement activities in Building 351A, which resulted in the elimination of survey unit designations 4, 15, 17, and 28. The eliminated survey units were combined into adjacent survey units. The final arrangement of the interior survey units is shown on Figure 4-1.

In the crawl space area, preliminary sampling to fully characterize the extent of contamination in Survey Units T and N (prior to establishment of Survey Units R and S) was performed. These sampling results are provided in Appendix J. The final arrangement of survey units in the crawl space is shown on Figure 4-2.

5.4 REMEDIAL ACTIONS IN BUILDING 351A INTERIOR

After gridding activities in the building interior were completed, scan surveys were begun in accordance with Section 3.6 of the TSP for Building 351A (TtEC 2008a). Scanning surveys for alpha and beta (as discussed in Sections 9.4.1 and 9.4.2 of this report) showed that contamination was present in Survey Units 7, 26, and 43 (Figure 4-1 shows the locations of these survey units). Characterization surveys were performed to determine the extent of contamination in each area.

A work instruction was prepared to remediate each contaminated area using a mechanical abrasive method (concrete scabbler) or removal of the wall materials. The work instruction included a complete description of the area remediated, including location drawings, photographs, and the results of the characterization survey. The work instruction (including characterization survey results) is provided in Appendix K.

Three separate remedial actions were performed in the building interior as described in the work instruction. All remediation spoils were disposed of as LLRW.

RASSs were performed over each remediated area, and the results are provided in Appendix J. All scanning results that were remediated are noted in Appendix D.

5.4.1 Survey Unit 7

Following the initial scanning surveys performed in Survey Unit 7, several areas of elevated activity were identified on the concrete floor. Characterization surveys were performed, which identified up to 40,660 dpm/100 cm² beta activity. The impacted area was approximately 2 inches by 2 inches in size.

Based on the results of the postremediation survey activities and subsequent systematic survey activity, the contaminated area in Survey Unit 7 was successfully remediated. The results of the systematic survey activities are provided in Appendices D, E, and G.

5.4.2 Survey Unit 26

During the initial scanning and static measurement survey activities, beta activity was discovered on a wall in Survey Unit 26 up to 8,211 dpm/100 cm². The area was characterized and found to contain 10,900 dpm/100 cm² beta activity that was confined to an area of approximately 4 square feet on the wall in the southwest corner.

Based on the results of the postremediation survey activities and subsequent systematic survey activity, the contaminated area in Survey Unit 26 was successfully remediated. The results of the systematic survey activities are provided in Appendices D, E, and G.

5.4.3 Survey Unit 43

During the initial survey activities performed in Survey Unit 43, a small area (approximately 40 square inches in size) with alpha contamination at 178 dpm/100 cm² was identified on the concrete floor. In addition, swipe sample analytical results showed loose alpha contamination at 10.82 dpm/100 cm². A characterization survey was performed that identified elevated alpha (570 dpm/100 cm²) and beta activity (1,720 dpm/100 cm²).

Based on the results of the postremediation survey activities and subsequent systematic survey activity, the contaminated area in Survey Unit 43 was successfully remediated. The results of the systematic survey activities are provided in Appendices D, E, and G.

5.5 FLOOR PENETRATION SURVEY

During the field activities, the presence of floor penetrations from where the piping had been removed was noted. As a result, a swipe survey of 58 floor penetration openings was performed to ensure that no contamination was present. None of the swipe sampling results indicated activity above the release criteria. The results from this survey are provided in Appendix J.

5.6 DEMOBILIZATION

Demobilization occurred in late November of 2008. All equipment used during the survey was verified to be less than the Regulatory Guide 1.86 (AEC 1974) limits specified for ¹³⁷Cs, ²³⁹Pu, ²²⁶Ra, ⁹⁰Sr, and ²³²Th. The equipment (which included instrumentation, tools, etc.) was then unconditionally released back to the applicable vendor for unrestricted use.

6.0 SURVEY INSTRUMENTATION

6.1 INSTRUMENTATION SELECTION

Instruments selected were deemed suitable for the physical and environmental site conditions as detailed in the TSP for Building 351A (TtEC 2008a) provided in Appendix M. The instruments and selected measurement methods used were able to detect the ROC or radiation type of interest, and were, in relation to the survey or analytical technique, capable of measuring levels equal to or less than the DCGL.

Appendix A provides a detailed description of all survey instruments used during the field activities.

6.2 INSTRUMENT CALIBRATION AND QUALITY ASSURANCE PROCEDURES

Prior to the start of and throughout the project, survey and laboratory instruments were maintained within calibration-based parameters using National Institute of Standards and Technology (NIST)-traceable standards. Survey instruments were source-checked daily, prior to and after each surveillance activity. Appendix B provides calibration certificates specific to field instrumentation used for data collection purposes and source certificates for radioactive sources used to perform instrument response checks and analysis.

6.3 INSTRUMENT OPERATIONAL CHECKS

Radiation detection instrumentation used in the scoping survey was maintained and calibrated to operate within manufacturer specifications so that the required sensitivity and precision were maintained. Specific calibration and maintenance were conducted by personnel familiar with the equipment or by manufacturers' technical representatives.

Procedures were developed for all field instrumentation to verify that the instruments were operating properly and that the data were valid with instrument calibrations that were NIST traceable (as performed by the instrument vendor). These procedures included functional operational checks, routine maintenance, calibration procedures, and operational instructions.

All of the instruments were within the ± 20 percent criteria established when setting up the baseline information. Had an instrument not met the criteria, it would have been removed from service and returned to the manufacturer for maintenance.

6.4 INSTRUMENTS FOR THE MEASUREMENT OF ALPHA AND BETA SURFACE ACTIVITY

6.4.1 Instruments for the Static Measurement of Alpha and Beta Surface Activity

Surveys for alpha and beta particulate radiation were performed using a Ludlum Model 2360 data logger equipped with a Ludlum Model 43-68, 126-cm² gas-flow proportional detector. This instrument measures alpha and beta radiation levels and can record data in scaler (time-integrated count) or ratemeter (instantaneous count rate) mode. The data logger, operated in the scaler mode, recorded static measurements for alpha and beta particulate radiation by positioning the detector assembly approximately 0.25 inch from the designated surveillance surface and completing a stationary 5-minute count cycle.

6.4.2 Instruments for the Scan Measurement of Alpha and Beta Surface Activity

Scan surveys for alpha and beta (particulate) radiation were performed using a Ludlum Model 2360 data logger equipped with a Ludlum Model 43-37 582-cm² or Ludlum Model 43-37-1 821 cm² gas-flow proportional detector. This instrument measures alpha and beta radiation levels and can record data in scaler (time-integrated count) or ratemeter (instantaneous count rate) mode. The detector position was adjusted so that the detector window was approximately 0.25 inch from the surveillance surface. The surveyor moved the detector at a scan speed of approximately 1 centimeter per second (cm/s) for alpha and beta scans while maintaining audio and visual observation of the instrument response.

6.4.3 Determination of Instrument Efficiency for Alpha and Beta Surface Activity Measurements

Instrument efficiency (ϵ_i), defined as the ratio between the net count rate (in counts per minute [cpm]) of the instrument and the surface emission rate of the calibration source for a specified geometry, is determined during calibration by the instrument vendor. The surface emission rate is the 2π particle fluence that is affected by both the attenuation and backscatter of the radiation emitted from the calibration source. Equation 7-1 from the Base-wide Plan Revision 1 (TtEC 2007) was used to determine alpha/beta instrument efficiencies for surveillance activities described within this report:

Equation 7-1 from the Base-wide Plan Revision 1

$$\epsilon_i = \frac{R_{S+B} - R_B}{q_{2\pi} \left(\frac{W_A}{S_A} \right)}$$

Where:

R_{S+B}	=	the gross count rate of the calibration measurement (cpm)
R_B	=	the background count rate in cpm
$q_{2\pi}$	=	surface emission rate of the calibration source (NIST-traceable)
W_A	=	active area of the detector window (cm ²)
S_A	=	area of the source (cm ²)

Note: This equation assumes that the dimensions of the calibration source are sufficient to cover the window of the instrument detector. If the dimensions of the calibration source are smaller than the detector's window, W_A is set equal to the dimensions of the calibration source (the quotient of W_A and S_A is set equal to 1).

Instrument efficiency was determined during calibration by obtaining static counts from an attached detector. The detector was positioned over a calibration source that features a NIST-traceable surface emission rate. The 2π particle fluence rate was corrected for decay. The surface emission rate of the source was then corrected for the area subtended by the probe. Additional considerations, supportive of reliable instrument efficiencies, include the following:

- Calibration Sources: Selected calibration sources feature alpha and beta emitter energies similar to those expected from contaminants in the field (similar to ROCs).
- Source Geometry Factors: Geometry dimensions are derived, based on a calibration source equal to or greater than the area of the probe.
- Source-to-Detector Distances: Calibration is performed at a “source-to-detector” distance identical to the “detector-to-surface” distance used in the field.
- Window Density Thickness: Calibration is performed using a detector window density thickness identical to that used in the field.
- Detector-Related Factors: The instrument user constantly monitored proper detector response. The user also accounted for extremes in ambient conditions (variations in temperature, pressure, and/or humidity) known during calibration and compared to those present in the field.

6.5 INSTRUMENT FOR THE MEASUREMENT OF GAMMA SURFACE ACTIVITY

Static surveys for gamma (photon) radiation were performed using a Ludlum Model 2350-1 data logger and a Ludlum Model 44-10 scintillation detector assembly that featured a 2-inch by 2-inch sodium iodide (NaI) crystal. Capable of detecting gamma photon energies ranging from 60 kilo-electron volts (keV) to 3 megaelectron volts (MeV), the instrument was programmed to respond to the full spectrum of gamma photon energies. Static photon measurements required positioning the detector assembly 4 inches (10 centimeters) above the designated surveillance surface and recording a stationary 60-second integrated count. NaI scintillation detectors are

very sensitive to photon gamma radiation and are ideal for locating elevated radiation levels above background when performing gamma scans and static measurements.

6.5.1 Instrument for the Scan Measurement of Gamma Surface Activity

Scan surveys for gamma (photon) radiation were performed using a Ludlum Model 2350-1 data logger equipped with a command device and a Ludlum Model 44-10 scintillation detector assembly, which features a 2-inch by 2-inch NaI crystal. Capable of detecting gamma photon energies ranging from 60 keV to 3 MeV, the instrument was programmed to respond to the full spectrum of gamma photon energies. Scan measurements were obtained by traversing a path at a maximum speed (scan rate) of approximately 0.5 meter per second and slowly sweeping the detector assembly in a serpentine (S-shaped) pattern, while maintaining the detector between 2.5 to 4 inches (6 to 10 centimeters) above the area surveyed.

6.6 INSTRUMENT FOR THE MEASUREMENT OF EXPOSURE RATES

Exposure rate measurements were obtained approximately 1 meter from the area surfaces using a Ludlum Model 19 scintillation detector.

6.7 INSTRUMENT FOR SWIPE SAMPLES

Swipe samples were collected for the analysis of removable contaminants. Swipe samples, also referred to as smear samples, were obtained at each discrete surveillance point in the survey units. All samples were processed using a Protean Instrument Corporation IPC9025 gas-flow proportional counter that features a low-background counting chamber. A microprocessor allows for data processing, and the unit provides a full range of simultaneous alpha and beta analysis at levels required for environmental release surveillance. Data are reported in units of dpm/100 cm².

6.8 SAMPLE COLLECTION AND ANALYSIS

6.8.1 Sample Preparation

Samples for radiological analysis in the crawl space area were collected in the field by trained and qualified radiological technicians. When soil samples were collected in the field, they were first processed through a colander apparatus to eliminate foreign objects and large debris. If the sample was acceptable for processing, an adequate amount of the sample was then placed into the geometry used by the on-site laboratory for analysis. If, in the opinion of the field technician, the sample was saturated beyond 10 percent moisture content by weight (as would have been indicated by a failure to pass material through the colander apparatus), then approximately four times the amount of sample needed for analysis was placed into a Ziploc[®] bag for subsequent drying by laboratory personnel.

The field technician who collected the sample then turned the samples over to the on-site laboratory using the chain-of-custody (COC) procedure described in the Base-wide Plan Revision 1 (TtEC 2007). Each sample was verified to contain identical information on the sample container and the associated COC form when it was received at the laboratory.

Once the samples were received by the on-site laboratory, each sample was verified to contain less than 10 percent moisture content by weight when massed. Samples with moisture content in excess of the 10 percent limit were dried in a laboratory oven. Once the moisture content was determined to be less than 10 percent, the sample was passed through consecutively smaller sieves, ending at a number 40, to screen for any foreign materials that may have been present. An aliquot of the remaining materials was then placed into the geometry necessary for analysis by the laboratory team.

6.8.2 On-site Gamma Spectroscopy

Solid samples from Building 351A were analyzed by gamma spectroscopy. Gamma spectroscopy analysis was performed using EG&G ORTEC[®] detector systems equipped with beryllium end caps (windows) that allow for enhanced quantification of low-energy gammas (such as ²²⁶Ra). Hardware features include a high-purity germanium gamma photon detector supported by a multi-channel analyzer and analysis software. Instrument hardware was calibrated using a multi-energy NIST-traceable source ranging from 50 keV to 2.6 MeV. All results were reported in pCi/g. The Laboratory Manager reviewed the data results, including energy spectrums, for quality assurance (QA) and to verify count integration, efficiency and background corrections, and the identification of overlapping peaks. If there was any question about the analytical results, the sample was reprocessed and possibly counted for a longer interval.

Gamma spectroscopy focuses on energetic photons emitted from ROCs. A spectral region of interest results around specified energy ranges, allowing for identification and quantification of the ROCs and progeny.

Additional reviews consisted of ensuring that 100 percent of the data comply with the method- and project-specific requirements as outlined in the Sampling and Analysis Plan (TtEC 2008b). QA data reviews included checking for compliance with the required quality control practices, SOPs, and method and project requirements.

Compilations of statistical summary tables were reviewed and checked for trends before the data were presented to the RASO for final concurrence. RASO then reviewed the data prior to concurring on release of material, backfilling of trenches, or disposal as LLRW. A summary of typical library peaks used for identification is provided in Table 6-1.

TABLE 6-1

SUMMARY OF LIBRARY FOR GAMMA SPECTROSCOPY ANALYSIS AT THE ON-SITE LABORATORY

Nuclide	Energy	Percent	Half-life	Nuclide	Energy	Percent	Half-life	Nuclide	Energy	Percent	Half-life
Ac-228	338.40	12.01%	6.13 hr	Cs-137	661.66	84.62%	30.1 y	Pb-214	77.11	10.70%	26.8 min
Ac-228	463.00	4.40%	6.13 hr	Eu-152	121.78	29.24%	12.7 y	Pb-214	87.20	3.70%	26.8 min
Ac-228	794.95	4.25%	6.13 hr	Eu-152	344.30	27.00%	12.7 y	Pb-214	241.92	7.47%	26.8 min
Ac-228	911.07	29.00%	6.13 hr	Eu-152	411.09	2.26%	12.7 y	Pb-214	295.22	19.20%	26.8 min
Ac-228	968.90	17.46%	6.13 hr	Eu-152	778.90	12.99%	12.7 y	Pb-214	351.99	37.10%	26.8 min
Am-241	26.99	2.50%	433 Y	Eu-152	964.00	14.58%	12.7 y	Pb-214	785.95	1.09%	26.8 min
Am-241	59.54	36.30%	433 Y	Eu-152	1408.08	21.21%	12.7 y	Ra-226	186.20	3.28%	1600 y
Bi-212	727.17	11.80%	60.55 min	Eu-154	123.10	40.46%	8.5 y	Th-230	67.67	0.37%	7.54E+04 y
Bi-212	785.42	2.00%	60.55 min	Eu-154	723.30	19.70%	8.5 y	Th-230	143.87	0.05%	7.54E+04 y
Bi-212	1620.56	2.75%	60.55 min	Eu-154	1274.80	35.50%	8.5 y	Th-230	253.73	0.01%	7.54E+04 y
Bi-214	609.32	46.09%	19.9 min	K-40	1460.80	10.70%	1.28E+09 y	Th-234	63.29	4.84%	578.4 hr
Bi-214	665.45	1.56%	19.9 min	Pa-234	131.28	20.00%	6.7 hr	Th-234	92.80	2.77%	578.4 hr
Bi-214	768.36	4.89%	19.9 min	Pa-234	883.24	15.00%	6.7 hr	Tl-208	583.14	86.00%	3.1 min
Bi-214	934.05	3.17%	19.9 min	Pa-234	946.00	12.00%	6.7 hr	Tl-208	860.47	12.00%	3.1 min
Bi-214	1120.28	15.04%	19.9 min	Pb-210	46.54	4.25%	22.3 y	Tl-208	2614.47	100.00%	3.1 min
Bi-214	1377.65	4.02%	19.9 min	Pb-212	74.81	9.60%	10.64 hr	U-235	143.76	10.50%	3.80E+06 y
Bi-214	1407.98	2.48%	19.9 min	Pb-212	77.11	17.50%	10.64 hr	U-235	163.35	4.70%	3.80E+06 y
Bi-214	1509.19	2.19%	19.9 min	Pb-212	87.20	6.30%	10.64 hr	U-235	185.05	54.00%	3.80E+06 y
Bi-214	1764.51	15.92%	19.9 min	Pb-212	238.63	43.10%	10.64 hr				
Co-60	1173.23	99.86%	5.272 Y	Pb-212	300.09	3.27%	10.64 hr				
Co-60	1332.51	99.98%	5.272 Y								

Abbreviations and Acronyms:

- | | |
|--------------------------|-----------------------|
| Ac-228 – actinium-228 | Pb-212 – lead-212 |
| Am-241 – americium-241 | Pb-214 – lead 214 |
| Bi-212 – bismuth-212 | Ra-226 – radium-226 |
| Bi-214 – bismuth-214 | Th-230 – thorium-230 |
| Co-60 – cobalt-60 | Th-234 – thorium-234 |
| Cs-137 – cesium-137 | Tl-208 – thallium-208 |
| Eu-152 – europium-152 | U-235 – uranium-235 |
| Eu-154 – europium-154 | Y – year |
| hr – hour | |
| K-40 – potassium-40 | |
| min – minute | |
| Pa-234 – proactinium-234 | |
| Pb-210 – lead-210 | |

6.8.2.1 On-site Laboratory Gamma Spectroscopy Analysis Flags

The gamma vision software produces a report once the analysis is complete. Each report is typically eight pages long, with a summary provided on the last page. The summary reports are then presented for each sample in Appendix H and Appendix J. The summary reports also identify flags (or symbols) that may be associated with each radionuclide, if appropriate. These flags and their associated meanings are presented below and do not necessarily specify that the data are not valid:

- **# – All peaks for activity calculation had bad shape.** The peak did not have a proper Poisson shape. These peaks are suspect, and the activity was calculated using a Simpson's Rule type of approximation.
- *** – Activity omitted from total.** The total activity is the scaled sum of the decay-corrected activity, if present, or the time-of-count activity. If the total activity was reported with a * symbol, this will indicate that the activity reported for some of the radionuclides was not included in the total activity of the sample. The two instances in which a sample will report a total activity with a * symbol are discussed below.
- **& – Activity omitted from total and all peaks had bad shape.** This flag is used when the radionuclide was not found and the peak did not have a proper Poisson shape. In short, the & symbol is used instead of two separate flags (< and # symbols). Radionuclides identified with a & symbol are not included in the total activity of the sample.
- **< – MDA value printed.** If the radionuclide was not found, the minimum detectable activity (MDA) value was printed with a < symbol after the radionuclide name, and no uncertainty is reported. Radionuclides identified with a < symbol are not included in the total activity.
- **A – Activity printed, but activity < MDA.** The activity calculation performed on the peaks for the isotope of concern yields a lower value than the calculation for the MDA. This identifies that a calculation was performed and the peaks were found, but the resulting activity was lower than the MDA.
- **B – Activity < MDA and failed test.** The peak was not statistically differentiable from background, and the background value was considered valid—activities reported with these codes should only be considered as < MDA values.
- **C – Area < Critical level.** The area of the peak was determined not to be statistically significant. The peak is not statistically differentiable from background.
- **F – Failed fraction or key line test.** The most abundant peak for the particular isotope was not observed in the correct proportions relative to other peaks, either high or low. The activity was determined using the most conservative estimate relative to using either the primary peak only or the secondary peaks only. Please note that it is impossible to fail the fraction or key line test for a ROC with only a single energy line in the library (i.e., ²²⁶Ra).

- **H – Half-life limit exceeded.** This flag would only show up on an old sample or a laboratory calibration standard with radioisotopes that are short lived. The date the sample was collected or the calibration standard was made is input into the software program. If an isotope is identified that has exceeded 12 half-lives from the time of collection, this flag will show up for that isotope.

6.8.2.2 On-Site Laboratory Counting Uncertainty

A detailed discussion of counting uncertainty is provided in Section 4.8 of the Survey Unit Project Reports Abstract (TtEC 2010).

6.8.3 Off-site Strontium-90, Alpha, and Gamma Spectroscopy

A minimum of 10 percent of original solid samples representing discrete locations within the corresponding survey units was submitted for ⁹⁰Sr and gamma photon analysis at an independent off-site laboratory.

The independent cross-reference QA analysis process was initiated by sending samples to the TestAmerica Laboratories in Saint Louis, Missouri (a National Voluntary Laboratory Accreditation Program-participating laboratory). Accepted laboratory techniques were used to identify the presence of beta and/or gamma emitting isotopes. Reported data results were reviewed for QA and reported in units of pCi/g. Analysis and review addressed count integration, efficiency and background corrections, and the processing of overlapping spectral peaks. Upon completion of data acquisition, analysis software processed spectral regions of interest around specified energy ranges, allowing for identification and quantification of associated radionuclides and progeny.

The evaluation and selection process for the off-site laboratory is documented in Section 4.5 of the Survey Unit Project Reports Abstract (TtEC 2010).

7.0 DETECTION SENSITIVITY – STATIC AND SCAN MINIMUM DETECTABLE CONCENTRATIONS

7.1 STATIC MDC

The static MDC represents the smallest level of radioactivity, on a surface, that is statistically detectable by the measurement process. The conventional equation, Equation 7-7 from the Base-wide Plan Revision 1 (TtEC 2007), is used to calculate instrument MDC in units of dpm/100 cm² for alpha and beta radiation. Equation 7-12 from the Base-wide Plan Revision 1 (TtEC 2007) is used to calculate the MDC for gamma radiation.

Survey Unit 1 data are used for example calculations in this section.

Equation 7-7 from the Base-wide Plan Revision 1

$$MDC = \frac{3 + 4.65\sqrt{R_B T_B}}{\varepsilon_s \varepsilon_i \frac{W_A}{100} T_B}$$

Where:

- R_B = background count rate (cpm)
- T_B = background counting time (minute)
- ε_i = instrument efficiency (count per particle)
- ε_s = contaminated surface efficiency (particle per disintegration)
- W_A = active area of the detector window (cm²)

Equation 7-12 from the Base-wide Plan Revision 1

$$MDCR = \frac{3 + 4.65\sqrt{R_B T_B}}{T_B}$$

Where:

- R_B = background count rate (cpm)
- T_B = background counting time (minute)

7.1.1 Calculation of Static MDC for Alpha Surveys (126-cm² Probe)

The following calculation of the MDC in dpm/100 cm² α is for the gas-proportional instrument with a 126-cm² probe area that was used for the direct measurement surveys of alpha radiation in Building 351A during the FSS. For this calculation, the observed average background count rate of 1.5 cpm was used (from Survey Unit 1), and measurement and background counting times were each 5 minutes:

Where:

instrument efficiency = 35.31 percent
surface efficiency factor = 25 percent
background count rate = 1.5 cpm
sample count time = 5 minutes
probe area size = 126 cm²

The MDC is calculated using Equation 7-7 from the Base-wide Plan Revision 1 (TtEC 2007):

$$MDC = \frac{3 + 4.65\sqrt{1.5 \times 5}}{0.3531 \times 0.25 \times \frac{126}{100} \times 5} = 28.29 \text{ dpm} / 100\text{cm}^2 \alpha$$

7.1.2 Calculation of Static MDC for Beta Surveys (126-cm² Probe)

The following calculation of the MDC in dpm/100 cm² β is for the gas-proportional instrument with a 126-cm² probe area that was used for the direct measurement surveys of beta radiation in Building 351A during the FSS. For this calculation, the observed average background count rate from Survey Unit 1 of 152.20 cpm was used, and measurement and background counting times were each 5 minutes:

Where:

instrument efficiency = 47.92 percent
surface efficiency factor = 25 percent
background count rate = 152.20 cpm
sample count time = 5 minutes
probe area size = 126 cm²

The MDC is calculated using Equation 7-7 from the Base-wide Plan Revision 1 (TtEC 2007):

$$MDC = \frac{3 + 4.65\sqrt{152.20 \times 5}}{0.4792 \times 0.25 \times \frac{126}{100} \times 5} = 173.94 \text{ dpm} / 100\text{cm}^2$$

7.1.3 Calculation of Static MDC for Gamma Surveys

The following calculation of the MDC in cpm γ is for the NaI instrument with a 2-inch by 2-inch probe that was used for the direct measurement surveys of gamma radiation in Building 351A during the FSS. For this calculation, the observed average background count rate of 6,593 cpm from Survey Unit 1 was used, and the measurement and background counting times were each 1 minute.

Where:

background count rate = 6,593 cpm

background count time = 1 minute

The MDC is calculated using Equation 7-12 from the Base-wide Plan Revision 1 (TtEC 2007):

$$MDCR = \frac{3 + 4.65 \sqrt{6,593 \times 1}}{1} = 380.57 \text{ cpm}$$

7.2 SCANNING MINIMUM DETECTABLE COUNT RATE

The minimum detectable number of net source counts in the scan interval, for an ideal observer, can be arrived at by multiplying the square root of the number of background counts (in the scan interval) by the detectability value associated with the desired performance (as reflected in d') as shown in Equation 7-5 from the Base-wide Plan Revision 1 (TtEC 2007):

Equation 7-5 from the Base-wide Plan Revision 1

$$MDCR = d' \sqrt{b_i} \left(\frac{60}{i} \right)$$

Where:

d' = index of sensitivity (α and β error)

b_i = number of background counts in scan time interval (count)

i = scan or observation interval(s)

7.2.1 Determination of MDCR and Use of Surveyor Efficiency (Beta, 821-cm² Probe)

The minimum detectable number of net source counts in the interval is given by S_i . Therefore, for an ideal observer, the number of source counts required for a specified level of performance can be arrived at by multiplying the square root of the number of background counts by the detectability value associated with the desired performance (as reflected in d'), as shown in Equation 7-5a from the Base-wide Plan Revision 1 (TtEC 2007):

Equation 7-5a from the Base-wide Plan Revision 1

$$S_i = d' \sqrt{b_i}$$

The following is the calculation of the minimum detectable count rate (MDCR) in dpm/100 cm² β for the gas-proportional instrument with a 821-cm² probe area that was used for the scan surveys performed in Survey Unit 1 during the FSS. For this calculation, the observed average background count rate of 878.20 cpm was used. It was noted that a typical source remained under the probe for 11.6 seconds during the scan; therefore, the average number of background counts in the observation interval was 169.79 [$b_i = 878.20 \times (11.6/60)$]. The required rate of true positives was 95 percent, and the false positives were 5 percent.

From Table 6.5 of MARSSIM (NUREG-1575; DoD et al. 2000), the value of d' , representing this performance goal, is 3.28.

The minimum detectable number of net source counts, S_i , needed was calculated by multiplying 13.03 (the square root of 169.79) by 3.28 (the d' value); so, S_i equals 42.74.

The MDCR, in cpm, was then calculated by:

$$MDCR = S_i (60 / i)$$

$$MDCR = 42.74(60/11.6) = 221.07 \text{ cpm}$$

The minimum detectable count rate assuming surveyor efficiency ($MDCR_{\text{Surveyor}}$) was calculated assuming a surveyor efficiency (p) of 0.5 and the MDCR of 221.07 cpm as follows:

$$MDCR_{\text{SURVEYOR}} = \frac{MDCR}{\sqrt{P}} = \frac{221.07}{\sqrt{0.5}} = 312.64 \text{ cpm}$$

7.2.2 Determination of MDCR and Use of Surveyor Efficiency, Gamma

The following is the calculation of the MDCR in cpm γ for the NaI instrument with a 2-inch by 2-inch NaI probe that was used for the scan surveys performed in Survey Unit 1 during the FSS. For this calculation, the observed average background count rate of 6,593 cpm was used. It was noted that a typical source remained under the probe for 1 second during the scan; therefore, the average number of background counts in the observation interval was 109.88 [$b_i = 6,593 \times (1/60)$]. The required rate of true positives was 95 percent, and the false positives were 5 percent.

From Table 6.5 of MARSSIM (NUREG-1575; DoD et al. 2000), the value of d' , representing this performance goal, is 3.28.

The minimum detectable number of net source counts, S_i , needed was calculated by multiplying 10.48 (the square root of 109.88) by 3.28 (the d' value); so, S_i equals 34.38.

The MDCR, in cpm, was then calculated by:

$$MDCR = S_i (60 / i)$$

$$MDCR = 34.38 (60 / 1) = 2,063$$

The $MDCR_{Surveyor}$ was calculated assuming a surveyor efficiency (p) of 0.5 and the MDCR of 2,139 cpm as follows:

$$MDCR_{SURVEYOR} = \frac{MDCR}{\sqrt{P}} = \frac{2,063}{\sqrt{0.5}} = 2,917.47 \text{ cpm}$$

7.3 SCAN MDC FOR BETA

The scan MDC is derived from the MDCR by applying conversion factors that account for detector and surface characteristics and surveyor efficiency. The MDCR accounts for the background level, performance criteria (d'), and observation interval. The observation interval during scanning is the actual time that the detector can respond to the contamination source. This interval depends on the scan speed, detector size in the direction of the scan, and area of elevated activity.

For alpha and beta radiation, the scan MDC for surfaces is calculated using Equation 7-6 from the Base-wide Plan Revision 1 (TtEC 2007):

Equation 7-6 from the Base-wide Plan Revision 1

$$ScanMDC = \frac{MDCR}{\sqrt{P} \times \epsilon_i \times \epsilon_s \frac{W_A}{100 \text{ cm}^2}}$$

Where:

- $MDCR$ = as discussed in Section 7.2.1
- ϵ_i = the instrument efficiency (count per particle)
- ϵ_s = the contaminated surface efficiency (particles per disintegration)
- W_A = the area of the detector window (cm^2)
- P = surveyor efficiency

The scan MDC (in dpm/100 cm^2) for ^{90}Sr on the concrete surfaces of Survey Unit 1 was determined for a background level of 878.20 cpm and an 11.6-second observation interval

using a gas-proportional detector (821-cm² probe area). For the specified level of performance, a 95 percent true positive rate and 5 percent false positive rate were required.

In Table 6.5 of MARSSIM (NUREG-1575; DoD et al. 2000), d' equals 3.28 and the MDCR is 221.07 cpm. Using a surveyor efficiency of 0.5 and assuming instrument and surface efficiencies of 0.4645 and 0.25, respectively, the scan MDC was calculated using Equation 7-6 from the Base-wide Plan Revision 1 (TtEC 2007):

$$\text{Scan MDC} = \frac{221.07}{\sqrt{0.5 \times 0.4645 \times 0.25 \times \frac{821}{100}}} = 327.93 \text{ dpm} / 100 \text{ cm}^2 \beta\gamma$$

7.4 SCAN MDC FOR ALPHA

Scanning for alpha emitters differs significantly from scanning for beta and gamma emitters in that the expected background response of most alpha detectors is very close to zero. The following covers scanning for alpha emitters. Assumptions are made that the surface being surveyed is similar in nature to the material on which the detector was calibrated. In this respect, the approach is purely theoretical. Surveying surfaces that are dirty, nonplanar, or weathered can significantly affect the detection efficiency and therefore bias the expected MDC for the scan.

The Model 43-37-1 proportional counter had a background count rate on the order of 1 to 3 cpm, and a single count should not cause a surveyor to investigate further. In this specific instance, the surveyor usually would have needed to get at least one count while passing over the source area before stopping for further investigation. Assuming this to be true, the probability of detecting given levels of alpha surface contamination can be calculated by use of Poisson summation statistics. Since the background count rate in Survey Unit 1 falls into this criteria, the use of Equation 7-4 from the Base-wide Plan Revision 1 (TtEC 2007) to calculate scan MDC for alpha is justified:

Equation 7-4 from the Base-wide Plan Revision 1

$$P(n \geq 2) = 1 - \left[1 + \frac{(GE + B)t}{60} \right] \left[e^{-\frac{(GE+B)t}{60}} \right]$$

Where:

- $P(n \geq 2)$ = probability of getting one or more counts during the time interval t (%)
- t = time interval (seconds)
- G = contamination activity (dpm)
- E = detector efficiency (4π)
- B = background count rate (cpm)

The following calculation of the probability for the gas-proportional instrument with a 821-cm² probe area was used for the scan surveys performed in Building 351A (with the values used from Survey Unit 1) during the FSS:

$$P(n \geq 2) = 1 - \left[1 + \frac{(36.5 * 0.1669 + 10.16)11.61}{60} \right] \left[e^{-\frac{(36.5 * 0.1669 + 10.16)11.61}{60}} \right]$$

Where:

$$\begin{aligned} t &= 11.61 \\ G &= 36.5 \text{ dpm} / 100 \text{ cm}^2 \\ E &= 0.1669 \\ B &= 10.16 \text{ cpm} \end{aligned}$$

Using Equation 7-4 from the Base-wide Plan Revision 1 (TtEC 2007), the probability of detecting 36.5 dpm/100 cm² alpha was 82.10 percent at a scan speed of 1.37 cm/s.

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8.0 SURVEY PROCEDURES AND MEASUREMENT DATA INTERPRETATION

8.1 SURVEY PROCEDURES

The survey procedures described in this section were performed in accordance with SOPs approved for use at HPS and were consistent with the Base-wide Plan Revision 1 (TtEC 2007). Class 1 survey units received 100 percent scan coverage, and the Class 2 survey unit received 50 percent scan coverage. Appendix C provides figures that identify the approximate surveillance points where measurements were logged and swipe samples or soil samples were collected.

8.1.1 Static Alpha, Beta, and Gamma Measurement Technique

Static contamination surveys were used to determine contamination levels on surface areas. These surveys were performed by holding a detection device over a surface for a specified time at a set distance. A systematic measurement pattern was used for both the reference area and the survey units.

8.1.2 Direct MicroR Exposure Rate Measurements

These surveys were performed to measure ambient gamma radiation levels. Exposure rate measurements were obtained by holding the detection device approximately 1 meter from the surface being surveyed. Instrumentation was allowed to stabilize before the measurement was taken.

Measurements were obtained in reference areas and compared with survey units to evaluate external exposure rates from gamma radiation. Exposure rate measurement results for each survey unit can be found in Appendix F.

8.1.3 Swipe Sample Technique

Swipe sampling was performed to assess the presence of radioactive contamination that is readily removed from a surface. Swipe samples were collected to evaluate the presence of alpha and beta surface activity. Swipe samples were obtained from each discrete survey point in the building interior. Swipe sampling analysis is discussed in Section 6.7. Loose surface activity measurement results can be found in Appendix G.

8.1.4 Scan Measurement Technique

Scan surveys are an integral part of survey programs conducted to determine contamination levels. The surveys are an evaluation technique performed by moving a detection device over a surface at a specified speed and distance above the surface to detect radiation. Scan surveys were used to identify areas that may have required additional survey measurements. Scan results from each survey unit are presented in Appendices D and E.

8.1.5 Soil Sampling Technique

Systematic soil samples were collected at the designated locations inside the crawl space area. The sampling technique is discussed in detail in Section 6.8. FSS Soil sample analytical results are provided in Appendix H.

8.2 DATA INTERPRETATION

The first-level check for validating data integrity during collection and reporting was verification of numerical work. After collection of survey data each day, the results were reviewed by the Radiological Control Technician to verify their completeness. The purpose of the first-level check was to ascertain that the data presented were free of numerical or transcription errors and that established procedures and methodology had been properly followed.

8.3 REVIEW OF DATA QUALITY OBJECTIVES

DQOs are qualitative and quantitative statements developed to define the purpose of the data collection effort, clarify what the data should represent to satisfy this purpose, and specify the performance requirements for the quality of information to be obtained from the data. These outputs are used to develop a data collection design that meets all performance criteria and other design requirements and constraints. The EPA has developed a seven-step process to develop DQOs.

8.3.1 Step One – State the Problem

Whether the scoping survey can recommend the building for an FSS or whether remediation is warranted must be determined. Therefore, the decision to be made can be stated as, “Do the results of the survey meet the release criteria?”

8.3.2 Step Two – Identify the Goal of the Study

What is the extent of residual radioactive material in surface building materials due to historical site operations? Determine whether surface and near-surface radionuclide concentrations in building materials exceed the release criteria. Determine if the crawl space radionuclides (including in the trench area) exceed the release criteria.

8.3.3 Step Three – Identify Information Inputs

Radionuclide surface activities in excess of the release criteria are the necessary inputs to the decision. Thus, the surface activities and soil samples from the impacted areas and non-impacted reference areas were measured.

8.3.4 Step Four – Define the Boundaries of the Study

The spatial boundaries for this survey effort were confined to the first-floor interior surfaces of Building 351A and the crawl space area beneath the structure.

8.3.5 Step Five – Develop the Analytical Approach

The intent of data validation for this survey data was to identify all of the impacted areas and to determine the extent and magnitude of contamination inside the interior or in the crawl space area of Building 351A. The decision rule for the ROCs was to consider any measurement above the release criteria as impacted, and to determine whether further investigation may be warranted.

8.3.6 Step Six – Specify Performance or Acceptance Criteria

The TtEC team established acceptable decision errors for this project to enable testing of data relative to guidelines. Surveys were conducted on 100 percent of the Class 1 survey units (interior and crawl space), and 50 percent of the Class 2 survey units, to ensure that all statistical testing criteria would be met.

8.3.7 Step Seven – Develop the Plan for Obtaining Data

To the extent practical, the design for collecting data presented in this report was optimized to achieve the stated DQOs. The scope of work and data collection process were designed to provide near real-time data during implementation of field activities. These data were used to modify and expand the scope of field activities, as needed, to verify that the DQOs were met.

8.4 SURFACE ACTIVITY MEASUREMENTS

Surveillance measurements were used to quantify surface activity levels mainly on remaining concrete surfaces. The International Organization for Standardization 7503-1 (ISO 1988), NUREG/CR-1507 (NRC 1997), and Selection and Use of Portable Radiological Survey Instruments for Performing In Situ Radiological Assessments in Support of Decommissioning (ASTM 1998) were used as technical guidance to ensure accuracy in the measurement of surface activity.

Equation 7-1a from the Base-wide Plan Revision 1 (TtEC 2007) is used to calculate the surface activity in units of dpm per 100 cm²:

Equation 7-1a from the Base-wide Plan Revision 1

$$A_S = \frac{R_{S+B} - R_B}{\varepsilon_i \varepsilon_s \frac{W_A}{100 \text{ cm}^2}}$$

Where:

- A_S = total surface activity (dpm/100 cm²)
- R_{S+B} = the gross count rate of the measurement in cpm
- R_B = the background count rate in cpm
- ε_i = the instrument efficiency
- ε_s = the contaminated surface efficiency
- W_A = the area of the detector window (cm²)

This equation has two efficiency terms discussed in Section 6.4.3.

8.4.1 Probe Area Correction Factor for Surface Activity Measurements

In Equation 7-1a from the Base-wide Plan Revision 1 (TtEC 2007) W_A is the size of the detector window active area. If the detector window area (cm²) is not equal to 100 cm², the detector response must be converted to units of dpm/100 cm². This conversion allows for direct comparison to the reference area readings. The area of the probe window is 126 cm² for the Model 43-68 probe.

9.0 ANALYSIS AND RESULTS

Interpreting a survey's results is most straightforward when measurement data are entirely higher or lower than the $DCGL_W$. In such cases, the decision that a survey unit meets or exceeds the release criterion requires little in terms of data analysis. However, formal statistical tests provide a valuable tool when a survey unit's measurements are neither clearly above nor entirely below the $DCGL_W$. Nevertheless, the survey design always makes use of the statistical tests in helping to ensure that the number of sampling points and the measurement sensitivity are adequate, but not excessive, for the decision made.

Radiological survey data were obtained in units of cpm and activity, which had no intrinsic meaning to the release limits. Data were converted to units of $dpm/100\text{ cm}^2$ to compare results with the release limits and to help identify which statistical tests, if any, would prove to be the best in interpreting data.

9.1 STATISTICAL TESTS

Once the survey data have been determined to be below the release criteria, a statistical test was performed on the survey data: the WRS test. Many statistical tests are based on the assumption that observations of the sample data follow a known distribution, such as the normal distribution. Such tests are known as parametric tests. Provided the distributional assumptions can be met, the observations can be measured on a continuous scale.

In comparison, statistical tests that make few or no assumptions about the distribution of the observations are known as distribution-free or nonparametric tests. Nonparametric tests are useful when the requirements of the parametric test cannot be met. For example, if observations can only be measured on a categorical scale, the sample size may be too small, or other distributional assumptions do not hold. In many situations, a nonparametric test is the only option, since many do not have parametric equivalents.

For the Building 351A FSS, both the Class 1 and 2 survey units inside the building and in the crawl space area were statistically tested.

9.2 DECISION ERRORS

There are two types of decision errors that can be made when performing any statistical test. The first type of decision error, called a Type I error, occurs when the null hypothesis is rejected when it is actually true. This type of error is sometimes called a "false positive." The probability of a Type I error is denoted by an α . The Type I error is often referred to as the significance level or size of the test.

The second type of decision error, called a Type II error, occurs when the null hypothesis is not rejected when it is actually false. This type of error is sometimes called a “false negative.” The probability of a Type II error is denoted by a β . The power of a statistical test is defined as the probability of rejecting the null hypothesis when it is actually false. It is numerically equal to $1-\beta$, where β is the Type II error rate.

The Building 351A survey was designed to limit Type I and Type II errors to a maximum probability of 5 percent. It is important to minimize the chances of concluding that a survey unit meets the release criteria (reject the null hypothesis) when it actually exceeds the limits (Type I error), and concluding that a survey unit exceeds the release criteria (accept the null hypothesis) when it actually meets the limits (Type II error).

9.3 WILCOXON RANK-SUM TEST

The WRS test is designed to test a hypothesis about the location of a population distribution. It is most often used to test the hypothesis about a population median and often involves the use of matched pairs. For example, reference area and survey unit data are tested for a median difference of zero. This test is also a nonparametric test that may be used when it is only necessary, or possible, to know if observed differences between two conditions are significant. The WRS test is structured to denote a change in magnitude, as opposed to any attempt at the quantitative measurement. This effect is further amplified when used with the “unity rule” presented in MARSSIM.

The null hypothesis is specifically stated for the WRS test that the residual contamination remaining in the survey unit exceeds the background level by more than the DCGL. Conversely, the alternate hypothesis is stated that the residual contamination remaining in the survey unit is less than the background level plus the DCGL. Explicitly stated:

H_o = Residual activity of the survey unit is greater than or equal to the background plus the DCGL

H_a = Residual activity of the survey unit is less than the background plus the DCGL

9.4 SCAN MEASUREMENT RESULTS

Scanning is the process by which portable radiation detection instruments are used to detect the presence of radionuclides on a specific surface (i.e., ground, wall, floor, equipment). The term scan survey is used to describe the process of moving portable radiation detectors across a suspect surface with the intent of locating radionuclide contamination. Investigation levels for scan surveys are determined during survey planning to identify areas of elevated activity. Scan surveys are performed to locate radiation anomalies indicating residual gross activity that may require further investigation or action.

The framework for determining the scan MDC is based on the premise that there are two stages of scanning. That is, decisions are not made on the basis of a single indication; rather, upon noting an increased number of counts, the surveyor pauses briefly and then decides whether to move on or take further measurements. Thus, scanning consists of two components: continuous monitoring and stationary sampling. In the first component, characterized by continuous movement of the probe, the surveyor has only a brief “look” at potential sources, determined by the scan speed. The surveyor’s willingness to decide that a signal is present at this stage is likely to be liberal, in that the surveyor should respond positively on scant evidence, since the only “cost” of a false positive is a little time. The second component occurs only after a positive response was made at the first stage. This response is marked by the surveyor interrupting the scanning and holding the probe stationary for a period of time, while comparing the instrument output signal during that time to the background counting rate.

For the most part, scan measurements for alpha, beta, and gamma radiation were comparable to background levels. Some additional biased static measurements were collected based on scan data results. Scan results from each survey unit are presented in Appendices D and E.

9.4.1 Alpha Scan Measurement Results

The alpha scans were conducted on 100 percent of the accessible surfaces in the Class 1 survey units and 50 percent of those in the Class 2 survey units, with special emphasis on upper horizontal surfaces. Scans were completed within each survey unit to identify potential elevated levels of alpha radiation, relative to corresponding background levels from the reference area.

As stated in Section 7.4, whenever one or more counts were detected, the surveyor would pause to determine if alpha contamination was actually present. Several survey units identified locations where the surveyor would pause to verify whether or not the alpha counts were present. If the alpha counts were not present, the resulting scan data were flagged as being verified with a 5-second pause. If the alpha counts were present, subsequent follow-up measurements would be collected.

The alpha scan data were first evaluated to determine whether any measurements exceeded the release criteria. The data were then evaluated to determine if any measurements exceeded 90 percent of the release criteria. Follow-up biased measurements were logged in those instances where 90 percent of the release criteria was noted. None of the biased static measurements exceeded the release criteria.

It is important to note that scan measurements first indicated that alpha contamination was present inside Survey Units 7, 26, and 43. These survey units were subsequently remediated, and postremediation scanning and static measurements indicated that remediation had been successful. The details of the remediation activities are provided in Section 5.4 and in Appendix K.

The final stage of data evaluation consisted of identifying patterns or areas where additional biased measurements would seem appropriate based on the scan data. Areas where biased measurements were collected are noted in the comment section of the data presented in Appendix D. None of the biased static measurements exceeded the release criteria.

9.4.2 Beta Scan Measurement Results

The beta scans were conducted on 100 percent of the accessible surfaces in the Class 1 survey units, with special emphasis on upper horizontal surfaces. Scans were completed within each survey unit to identify elevated levels of beta radiation, relative to corresponding background levels from the reference area.

The beta scan data were first evaluated to determine whether any measurements exceeded the release criteria. In areas where elevated measurements were noted, biased measurements may have been collected, and these are noted in the comments section of the beta scan measurement report provided in Appendix D.

The data were then evaluated to determine whether any measurements exceeded 90 percent of the release criteria. The final stage of data evaluation consisted of identifying patterns or areas where additional biased measurements would seem appropriate based on the scan data. These areas are noted in the comments section of the scan data in Appendix D. No biased static measurements exceed the release criteria.

Scan measurements first indicated that beta contamination was present inside Survey Units 7, 26, and 43. These survey units were subsequently remediated, and postremediation scanning and static measurements confirmed that remediation efforts were successful. The details of the remedial action are provided in Section 5.4 and in Appendix K.

9.4.3 Gamma Scan Measurement Results

The gamma scans were conducted on 100 percent of the accessible surfaces in the Class 1 survey units and 50 percent of those in the Class 2 survey units, with special emphasis on upper horizontal surfaces. Scans were completed within each survey unit to identify elevated levels of gamma radiation, relative to corresponding background levels from the reference area.

Data were reviewed to identify any measurements that exceeded the investigation limit of 3 sigma plus background. Several measurements throughout the building exceeded this value. When identified, part of the investigation was to review the beta scans from the same areas to identify any relationships or patterns within the data. These measurements were then compared to the beta measurements to determine whether additional follow-up measurements and/or sampling were necessary. These readings could be attributed to a disparity in the naturally occurring radioactive materials between the reference area and the survey units. Based on the review of

the beta measurements, it was determined that additional follow-up measurements were not necessary due to gamma scans identified above the investigation level. The gamma scan measurement results are provided in Appendix E.

9.5 SWIPE MEASUREMENT ANALYSIS AND RESULTS

A comprehensive radiological survey was implemented using MARSSIM (NUREG-1575; DoD et al. 2000) guidance, and a complete set of swipe measurements was obtained at each discrete sample point in every corresponding survey unit. Collected data were reviewed by the area supervisor and then examined by the TtEC Radiation Safety Officer (RSO) to determine whether investigative levels had been exceeded.

For each Class 1 survey unit and Class 2 interior survey unit, average systematic swipe data, or removable contamination, were all less than 3.72 dpm/100 cm² for alpha activity and 12.67 dpm/100 cm² for beta activity. No swipe measurement was greater than 20 percent of the release criteria (after all remedial actions were completed), and all swipe data were less than 20 percent of the total net residual activity identified within the survey unit. The swipe measurement results for each survey unit are provided in Appendix G.

9.6 STATIC ALPHA MEASUREMENT ANALYSIS AND RESULTS

A comprehensive radiological survey was implemented using MARSSIM (NUREG-1575; DoD et al. 2000) guidance, and complete sets of alpha measurements were obtained in the reference area and corresponding survey units. Basic statistical quantities were calculated for the data in an effort to identify patterns, relationships, and anomalies. Collected data were reviewed by the area supervisor and then examined by the TtEC RSO to determine whether investigative levels had been exceeded. Measurements in all survey units were comparable with background levels.

Alpha survey data were converted to units of dpm/100 cm². The measurements were compared directly to background measurements after conversion of the background data. No sample measurement exceeded the release criteria, and the null hypothesis was rejected in all cases. Additional biased measurements were collected in various survey units. The biased measurement locations were dictated by the scan measurements. No biased measurements exceeded the investigation level.

Table 9-1 provides a summary of corresponding alpha measurements and WRS data for each Class 1 and 2 survey unit.

The WRS unity rule test for each survey unit indicates that the null hypothesis is rejected and the respective survey units meet the release criteria. Detailed survey results are available in Appendix D, while the statistical test results are available in Appendix I.

9.7 STATIC BETA MEASUREMENT ANALYSIS AND RESULTS

A comprehensive radiological survey was implemented using MARSSIM (NUREG-1575; DoD et al. 2000) guidance, and complete sets of beta measurements were obtained in the associated reference areas and corresponding survey units. Collected data were reviewed by the area supervisor and then examined by the TtEC RSO to determine whether investigative levels had been exceeded. All FSS static beta readings in all survey units were comparable with background levels.

Systematic beta survey data were converted to units of dpm/100 cm². The measurements were compared directly to background measurements. No sample measurement exceeded the release criteria, and the null hypothesis was rejected in all cases. Additional biased measurements were collected in various survey units. The biased measurement locations were dictated by the scan measurements. None of the FSS biased static readings exceeded the beta investigation level.

Table 9-2 provides a summary of corresponding beta measurements and WRS data.

The WRS unity rule test for each survey unit indicates that the null hypothesis is rejected and the respective survey units meet the release criteria. Detailed results are available in Appendix D, and the results from the statistical test are presented in Appendix I.

TABLE 9-1

BUILDING 351A ALPHA MEASUREMENTS SUMMARY

Survey Unit	Area (m ²)	Class	Alpha Mean (dpm _{NET} /100 cm ²)	Alpha Standard Deviation (dpm/100 cm ²)	Alpha Median (dpm _{NET} /100 cm ²)	N Required (Survey Unit)	N Taken (Survey Unit)	Null Hypothesis
1	14.63	1	-1.17	5.61	-0.45	8	20	Rejected
2	28.47	1	-3.40	3.37	-4.14	8	20	Rejected
3	42.87	1	-3.10	4.91	-1.77	8	20	Rejected
5	57.86	1	-9.71	3.87	-10.11	8	26	Rejected
6	12.60	1	-2.30	4.61	-2.30	8	20	Rejected
7	75.22	1	-0.91	3.14	-1.41	8	20	Rejected
8	26.44	1	-2.58	4.75	-3.22	8	20	Rejected
9	69.59	1	0.18	6.63	0.45	8	20	Rejected
10	69.65	1	-1.53	6.02	-1.35	8	20	Rejected
11	24.00	1	-4.05	4.07	-2.30	8	20	Rejected
12	67.00	1	-1.68	5.82	-0.89	8	20	Rejected
13	92.34	1	-4.05	4.20	-5.06	8	20	Rejected
14	44.00	1	-2.79	3.96	-4.05	8	20	Rejected
16	22.01	1	-2.61	5.49	-2.25	8	20	Rejected
18	23.30	1	-1.29	7.13	-2.30	8	20	Rejected
19	52.04	1	-3.34	3.73	-2.66	8	26	Rejected
20	56.35	1	-4.16	3.26	-3.54	8	20	Rejected
21	63.64	1	-5.52	4.58	-5.98	8	20	Rejected
22	54.85	1	-3.40	5.57	-4.14	8	20	Rejected
23	42.28	1	-1.75	5.71	-3.22	8	20	Rejected
24	31.38	1	-3.81	5.24	-4.43	8	20	Rejected
25	49.56	1	-2.52	5.85	-1.77	8	26	Rejected
26	57.05	1	-7.81	4.39	-7.47	8	26	Rejected
27	60.70	1	-2.39	5.29	-3.22	8	20	Rejected
29	16.24	1	-3.28	4.23	-4.43	8	20	Rejected
30	54.39	1	-2.21	5.51	-2.66	8	20	Rejected
31	30.13	1	-2.12	5.29	-1.38	8	20	Rejected
32	94.69	1	-3.00	3.84	-3.54	8	26	Rejected
33	94.56	1	-1.95	5.91	-4.43	8	20	Rejected
34	14.46	1	-1.10	6.84	-2.30	9	20	Rejected

TABLE 9-1

BUILDING 351A ALPHA MEASUREMENTS SUMMARY

Survey Unit	Area (m ²)	Class	Alpha Mean (dpm _{NET} /100 cm ²)	Alpha Standard Deviation (dpm/100 cm ²)	Alpha Median (dpm _{NET} /100 cm ²)	N Required (Survey Unit)	N Taken (Survey Unit)	Null Hypothesis
35	22.60	1	-2.39	6.63	-2.30	8	26	Rejected
36	55.06	1	-8.62	6.03	-10.99	8	26	Rejected
37	12.52	1	-4.09	5.15	-5.31	8	20	Rejected
38	13.68	1	-2.61	5.37	-3.15	9	20	Rejected
39	13.95	1	-1.89	4.47	-2.25	8	20	Rejected
40	95.61	1	-2.57	5.22	-2.66	8	20	Rejected
41	43.38	1	1.10	8.37	-0.46	9	20	Rejected
42	89.64	1	-4.50	6.28	-5.84	8	20	Rejected
43	14.93	1	-1.49	3.01	-1.41	8	20	Rejected
44	14.13	1	-3.98	5.32	-5.31	8	20	Rejected
45	990.41	2	-0.42	5.63	0.17	8	20	Rejected
46	871.58	2	-4.54	4.99	-4.88	8	20	Rejected
47	826.14	2	-2.02	5.06	-1.51	10	20	Rejected

Notes:

See Section 9.3 for hypothesis.

Abbreviations and Acronyms:

- cm² – square centimeter
- dpm – disintegrations per minute
- dpm_{NET} – net disintegrations per minute
- m² – square meter
- N – number

**TABLE 9-2
BUILDING 351A BETA MEASUREMENTS SUMMARY**

Survey Unit	Area (m ²)	Class	Beta Mean (dpm _{NET} /100 cm ²)	Beta Standard Deviation (dpm/100 cm ²)	Beta Median (dpm _{NET} /100 cm ²)	N Required (Survey Unit)	N Taken (Survey Unit)	Null Hypothesis
1	14.63	1	-142.50	225.81	-123.88	8	20	Rejected
2	28.47	1	67.56	162.32	115.95	8	20	Rejected
3	42.87	1	-8.68	103.15	-11.98	8	20	Rejected
5	57.86	1	-57.37	106.14	-63.00	8	26	Rejected
6	12.60	1	241.63	144.31	261.27	8	20	Rejected
7	75.22	1	29.10	78.63	27.84	8	20	Rejected
8	26.44	1	48.16	135.26	101.26	8	20	Rejected
9	69.59	1	-112.29	245.82	-80.82	8	20	Rejected
10	69.65	1	-111.36	216.16	-38.42	8	20	Rejected
11	24.00	1	-15.54	159.15	-68.02	8	20	Rejected
12	67.00	1	-17.19	94.91	-28.51	8	20	Rejected
13	92.34	1	-80.16	156.41	-91.98	8	20	Rejected
14	44.00	1	-134.88	282.67	-307.39	8	20	Rejected
16	22.01	1	-214.71	187.95	-294.14	8	20	Rejected
18	23.30	1	76.52	217.99	-30.15	8	20	Rejected
19	52.04	1	-154.23	100.90	-152.45	8	26	Rejected
20	56.35	1	-133.28	87.82	-127.66	8	20	Rejected
21	63.64	1	-111.93	128.65	-168.51	8	20	Rejected
22	54.85	1	54.73	165.36	122.13	8	20	Rejected
23	42.28	1	45.61	163.68	-4.64	8	20	Rejected
24	31.38	1	-169.89	118.82	-188.81	8	20	Rejected
25	49.56	1	-127.53	86.03	-97.92	8	26	Rejected
26	57.05	1	13.18	93.18	40.47	8	26	Rejected
27	60.70	1	83.64	180.29	166.19	8	20	Rejected
29	16.24	1	-95.68	106.04	-130.97	8	20	Rejected
30	54.39	1	-75.44	111.40	-82.22	8	20	Rejected
31	30.13	1	30.07	149.83	27.05	8	20	Rejected
32	94.69	1	-93.66	90.50	-70.65	8	26	Rejected
33	94.56	1	-53.63	102.36	-69.82	8	20	Rejected
34	14.46	1	82.86	210.21	88.12	9	20	Rejected
35	22.60	1	11.29	166.56	-57.20	8	26	Rejected

**TABLE 9-2
BUILDING 351A BETA MEASUREMENTS SUMMARY**

Survey Unit	Area (m ²)	Class	Beta Mean (dpm _{NET} /100 cm ²)	Beta Standard Deviation (dpm/100 cm ²)	Beta Median (dpm _{NET} /100 cm ²)	N Required (Survey Unit)	N Taken (Survey Unit)	Null Hypothesis
36	55.06	1	42.80	125.77	41.88	8	26	Rejected
37	12.52	1	-191.67	87.32	-197.90	8	20	Rejected
38	13.68	1	-157.14	285.28	-331.24	9	20	Rejected
39	13.95	1	-191.52	275.56	-325.94	8	20	Rejected
40	95.61	1	-26.69	97.17	-8.68	8	20	Rejected
41	43.38	1	41.59	155.96	96.62	9	20	Rejected
42	89.64	1	-340.65	189.21	-404.11	8	20	Rejected
43	14.93	1	-164.07	201.66	-277.12	8	20	Rejected
44	14.13	1	-35.37	106.80	-58.25	8	20	Rejected
45	990.41	2	-68.91	137.25	-63.69	8	20	Rejected
46	871.58	2	-25.14	81.22	-28.91	8	20	Rejected
47	826.14	2	400.29	155.87	369.63	10	20	Rejected

Notes:

See Section 9.3 for hypothesis.

Abbreviations and Acronyms:

cm² – square centimeter
dpm – disintegrations per minute
dpm_{NET} – net disintegrations per minute
m² – square meter
N – number

9.8 STATIC GAMMA MEASUREMENT ANALYSIS AND RESULTS

A comprehensive radiological survey was implemented using MARSSIM (NUREG-1575; DoD et al. 2000) guidance, and complete sets of gamma measurements were obtained in the associated reference areas and Building 351A survey units. Data were reviewed to identify any measurements that exceeded the investigation limit. These measurements were then compared to the beta measurements to determine whether additional follow-up measurements and/or sampling were necessary. Based on review of the beta measurements, it was determined that additional follow-up measurements were not necessary. Additional biased measurements were collected in various survey units. The biased measurement locations were dictated by the alpha and beta scan measurements, and comments are noted in the scan data in Appendix D when this was performed. Gamma activity results are presented with a summary in Appendix E.

A summary of the static gamma measurement data is presented in Table 9-3.

As previously stated in Section 3.4.2, there are currently no established release criteria for building interior surfaces based on gamma exposure rates. However, guidance document NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination (NRC 1992), specifies that the average of exposure rates, which were measured 1 meter above the surveillance surface of a survey unit, should not exceed twice the background. If this criterion was applied to the gamma radiation levels at Building 351A, then Building 351A would be considered acceptable for unconditional release.

9.9 CRAWL SPACE SOIL SAMPLE RESULTS

The samples discussed in this section were analyzed by the on-site laboratory by gamma spectroscopy. A minimum of 10 percent of the FSS samples were also analyzed for ^{239}Pu and ^{90}Sr . Individual gamma spectroscopy results are presented in Appendix H, and the sample location diagrams are shown on Figure 4-2 for the original Class 1 survey unit arrangement, and in Appendix C for Survey Units R, S, T, and U.

9.9.1 Phase V Soil Sample Results in Crawl Space Area

As discussed in Section 5.2.4, the soil samples collected for the Phase V survey activities (16 per survey unit) were repackaged into current laboratory geometries and reanalyzed by the on-site laboratory before fieldwork was begun. The results of the 2002 original analysis and the 2008 reanalysis are presented in Appendix B of the TSP for Building 351A (provided in Appendix M).

Section 2.2.2 of the TSP indicated that the repackaged Phase V soil samples were acceptable to support unrestricted release in Survey Units A through M, O, and P, and remediation was warranted in the trench area (Survey Unit T) and in Survey Unit N.

**TABLE 9-3
BUILDING 351A GAMMA MEASUREMENTS SUMMARY**

Survey Unit	Area (m ²)	Class	Average Gamma (cpm)	Background (cpm)	Net Result (cpm)
1	14.63	1	6171.6	6592.8	-421.2
2	28.47	1	6126.5	5700.4	426.1
3	42.87	1	5762.0	5700.4	61.6
5	57.86	1	5916.2	5922.5	-6.3
6	12.60	1	6621.0	5700.4	920.6
7	75.22	1	4874.9	5350.0	-475.1
8	26.44	1	4961.4	4985.1	-23.7
9	69.59	1	4671.2	4681.4	-10.3
10	69.65	1	4351.4	4807.9	-456.5
11	24.00	1	4397.3	4807.9	-410.6
12	67.00	1	4781.3	4807.9	-26.6
13	92.34	1	4039.1	4807.9	-768.8
14	44.00	1	4464.1	4807.9	-343.8
16	22.01	1	4268.9	4807.9	-539.0
18	23.30	1	4418.2	4807.9	-389.8
19	52.04	1	3804.2	4596.2	-792.0
20	56.35	1	3988.9	3678.5	310.4
21	63.64	1	4119.5	4807.9	-688.4
22	54.85	1	4460.8	4807.9	-347.1
23	42.28	1	4193.9	4807.9	-614.0
24	31.38	1	3988.9	4807.9	-819.0
25	49.56	1	3713.3	4596.2	-882.8
26	57.05	1	4245.3	5090.5	-845.1
27	60.70	1	4671.8	4807.9	-136.2
29	16.24	1	4054.8	4807.9	-753.2
30	54.39	1	3799.2	4681.4	-882.3
31	30.13	1	4560.8	4807.9	-247.1
32	94.69	1	4102.5	4596.2	-493.7
33	94.56	1	3916.9	4807.9	-891.0
34	14.46	1	4278.3	4807.9	-529.7
35	22.60	1	4838.0	4807.9	30.1
36	55.06	1	4586.0	5090.5	-504.4
37	12.52	1	3897.7	4596.2	-698.5
38	13.68	1	4301.4	4807.9	-506.5
39	13.95	1	4043.8	4681.4	-637.7
40	95.61	1	4165.4	4807.9	-642.5
41	43.38	1	4681.1	4807.9	-126.8
42	89.64	1	4715.9	4807.9	-92.0
43	14.93	1	5111.2	5472.2	-361.0
44	14.13	1	4857.6	4807.9	49.7
45	990.41	2	5445.2	5710.1	-264.9
46	871.58	2	5460.3	5710.1	-249.8
47	826.14	2	5078.1	4831.4	246.7

Abbreviations and Acronyms:

cpm – counts per minute
m² – square meter

The WRS test results are provided in Appendix I. The WRS unity rule tests for these areas indicate that the null hypothesis is rejected in Survey Units A through M, O, and P. The data from Survey Unit N were not tested since remediation was performed in this area, and Survey Units R, S, and U were specifically designed to support WRS unity rule tests in these areas.

9.9.2 Survey Units R, S, and U Results

After remediation was completed in Survey Units R and S (as discussed in Section 5.2.4), 20 systematic soil samples were collected from these areas. Additionally, a new Class 2 area was designated as Survey Unit U, and 20 systematic samples were also collected in this area. Sampling results are presented in Appendix H.

The WRS test results are provided in Appendix I. The WRS unity rule tests for these areas indicate that the null hypothesis is rejected in Survey Units R, S, and U. Summaries of the data from Survey Units R, S, and U are provided in Tables 9-4, 9-5, and 9-6, respectively.

9.9.3 Survey Unit T Results

After remedial actions were completed as discussed in Section 5.2.4, 18 systematic samples were collected in Survey Unit T (the trench) in the Building 351A crawl space area. Sampling results are presented in Appendix H. No activity above the release criteria was identified.

The WRS test results for this survey unit are presented in Appendix I. The WRS unity rule test indicates that the null hypothesis is rejected in this area.

A summary of the data from Survey Unit T is presented in Table 9-7.

9.9.4 Laboratory Analysis and Quality Assurance Checks of Off-site Laboratory Data

Results from the on-site and off-site laboratory data were reviewed to ensure that the activities for FSS samples for all ROCs were below the release criteria. These data were then evaluated by the Laboratory Manager, and all results were comparable and followed closely between both laboratories.

To perform a detailed comparison, analytical results for the samples that were analyzed by both the on-site and off-site laboratories were placed into a spreadsheet so that data could be compared directly. The review consisted of identifying sample results that reported activity above the MDA/method detection limit (MDL) for any ROC. Once identified, the next step was to determine if either laboratory reported results above the MDA/MDL for the same samples. The on-site laboratory reported ^{137}Cs activity above the MDA for 52 of the 75 samples, while the off-site laboratory reported ^{137}Cs activity above the MDL for 4 samples. Direct comparisons were made in one instance because ^{137}Cs activity was reported above the MDL by both laboratories, namely sample Bldg351A-P-12. This sample had a relative percent difference

(RPD) of 32.99. The data from Bldg351A-P-12 were evaluated, and the slight difference in ^{137}Cs activity (0.093 pCi/g for the on-site laboratory and 0.067 pCi/g for the off-site laboratory) was determined to be small enough (a difference of 0.026 pCi/g) that the RPD was considered acceptable.

The on-site laboratory analyzed the samples directly for ^{226}Ra using EPA 901.1 Modified method and calculating the ^{226}Ra activity from the 3.6 percent abundant 186.2 keV gamma spectrum line for ^{226}Ra . The off-site laboratory counted the samples using EPA 901.1 Modified method. The ^{226}Ra results were calculated and reported from the 46.09 percent abundant 609.31 keV gamma spectrum line of bismuth-214 (^{214}Bi) after an in-growth period of greater than 21 days to allow the ^{214}Bi to approach secular equilibrium with ^{226}Ra . Both laboratories reported ^{226}Ra activity above the MDA/MDL for 21 of the 75 samples. Since the ^{226}Ra activity reported for one of the samples from each laboratory was not reported by the other laboratory, the ^{226}Ra activities for 54 samples were compared directly for precision and found to be acceptable. The results of the comparisons in instances where both laboratories reported activity above the MDA/MDL showed RPDs ranging from 56.99 to 168.92. Since the on-site laboratory reported higher ^{226}Ra activity than the off-site laboratory and the RPDs were not within 30, no additional comparisons or investigations were made. However, as an added comparison for informational purposes, the daughter isotopes of ^{226}Ra (^{214}Bi and lead-214) were compared.

When comparing the ^{214}Bi and lead-214 activity, the results for all samples were found to be comparable to the ^{226}Ra activity reported by the off-site laboratory. The highest ^{226}Ra activity reported by the off-site laboratory was 0.490 pCi/g, which is well below the release criteria and well below the MDA reported for the same sample processed in the on-site laboratory. In addition, the ^{226}Ra activity reported for all samples from either laboratory were well below the release criteria. As a result, no further laboratory comparisons were made for ^{226}Ra .

As discussed in Section 3.1.2.1, ^{228}Ac was used as a surrogate to determine actual ^{232}Th activity. Since operations at HPS concluded more than 30 years ago, the ^{228}Ac is assumed to be in secular equilibrium with the ^{228}Th . Following a similar process to the ^{226}Ra comparison, 30 of the sample results from both laboratories indicated ^{228}Ac activity above the MDA/MDL. In these instances, the ^{228}Ac RPDs ranged from 0.36 to 126.32. The data were reviewed more closely, and the maximum ^{228}Ac activity reported by the on-site laboratory was 0.67 pCi/g, while the maximum activity reported by the off-site laboratory was 0.53 pCi/g. Since both results were less than the release criterion for ^{232}Th by at least 1.02 pCi/g (the release criterion is provided in Table 3-1), the results were considered acceptable.

Table 9-8 presents a comparison summary of the on-site and off-site laboratory sample results. Sampling results are provided in Appendices H and J.

**TABLE 9-4
BUILDING 351A SURVEY UNIT R SAMPLING SUMMARY**

Class 1 Soil Measurements - Building 351A - Survey Unit R

Sample No.	Date	Time	Results (pCi/g)														
			¹³⁷ Cs	MDA	2σ Total	⁹⁰ Sr	MDA	2σ Total	²³⁹ Pu	MDA	2σ Total	²²⁶ Ra	MDA	2σ Total	²³² Th	MDA	2σ Total
57	1/16/2009	10:45:00	0.0688	0.038	0.050							0.140	1.100	1.295	0.226	0.214	0.124
58	1/16/2009	10:48:00	0.0251	0.029	0.033							0.168	0.673	0.790	0.020	0.190	0.011
59	1/16/2009	10:51:00	-0.0107	0.045	0.077	0.014	0.053	0.028				0.555	1.140	1.385	0.048	0.192	0.036
60	1/16/2009	10:54:00	0.0100	0.030	0.038							0.828	0.982	1.197	0.635	0.164	0.255
61	1/16/2009	10:57:00	-0.0416	0.042	1.663							0.544	1.020	1.247	0.048	0.177	0.101
62	1/16/2009	11:00:00	-0.0355	0.040	0.415							0.474	1.140	1.391	-0.096	0.204	0.168
63	1/16/2009	11:03:00	0.0421	0.033	0.039							0.078	0.821	0.967	0.075	0.154	0.045
64	1/16/2009	11:06:00	0.0225	0.036	0.041							-0.041	0.869	1.180	0.296	0.198	0.137
65	1/16/2009	11:09:00	0.0413	0.041	0.049	0.024	0.045	0.029				0.608	1.150	1.392	0.360	0.165	0.156
66	1/16/2009	11:12:00	0.0024	0.027	0.033							0.971	0.949	1.164	0.462	0.155	0.226
67	1/16/2009	11:45:00	0.0553	0.036	0.046							-0.152	0.760	2.060	-0.075	0.186	0.094
68	1/16/2009	11:18:00	0.0383	0.022	0.030							-0.461	0.657	-3.748	0.083	0.111	0.077
69	1/16/2009	11:21:00	0.0179	0.041	0.047							0.012	1.180	1.418	0.104	0.211	0.070
70	1/16/2009	11:24:00	0.0361	0.043	0.051	0.025	0.049	0.031	-0.018	0.017	0.045	0.083	1.090	1.284	0.157	0.200	0.101
71	1/16/2009	11:27:00	0.0526	0.023	0.033							-0.031	0.662	0.871	0.269	0.100	0.133
72	1/16/2009	11:30:00	0.0142	0.039	0.043							0.426	0.761	0.917	0.243	0.173	0.147
73	1/16/2009	11:33:00	-0.0218	0.039	0.121	0.024	0.060	0.035	-0.031	0.024	0.063	0.243	0.856	1.022	-0.010	0.197	0.012
74	1/16/2009	11:36:00	-0.0063	0.047	0.071							0.562	1.180	1.437	0.189	0.206	0.099
75	1/16/2009	11:39:00	0.0312	0.034	0.039							-0.314	0.865	3.446	0.158	0.212	0.085
76	1/16/2009	11:42:00	0.0157	0.035	0.038							0.263	0.807	0.961	0.157	0.197	0.089
		mean	0.018			0.022			-0.025			0.248			0.167		
		std dev	0.030			0.005			0.009			0.371			0.179		
		median	0.020			0.024			-0.025			0.206			0.157		

Abbreviations and Acronyms:

- ¹³⁷Cs – cesium-137
- MDA – minimum detectable activity
- pCi/g – picocuries per gram
- ²³⁹Pu – plutonium-239
- ²²⁶Ra – radium-226
- ⁹⁰Sr – strontium-90
- std dev – standard deviation
- ²³²Th – thorium-232

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**TABLE 9-5
BUILDING 351A SURVEY UNIT S SAMPLING SUMMARY**

Class 1 Soil Measurements - Building 351A - Survey Unit S

Sample No.	Date	Time	Results (pCi/g)														
			¹³⁷ Cs	MDA	2σ Total	⁹⁰ Sr	MDA	2σ Total	²³⁹ Pu	MDA	2σ Total	²²⁶ Ra	MDA	2σ Total	²³² Th	MDA	2σ Total
34	1/16/2009	8:00:00	0.0864	0.037	0.050												
35	1/16/2009	8:05:00	-0.0229	0.035	0.105												
36	1/16/2009	8:10:00	-0.0250	0.030	0.112												
37	1/16/2009	8:15:00	0.0887	0.042	0.056												
38	1/16/2009	8:20:00	0.0056	0.035	0.040												
39	1/16/2009	8:29:00	0.0125	0.031	0.033	0.050	0.270	0.280	-0.006	0.046	0.055	0.404	0.764	0.920	0.212	0.195	0.115
40	1/16/2009	8:30:00	0.0050	0.020	0.026							0.820	0.835	1.020	0.259	0.139	0.128
41	1/16/2009	8:35:00	-0.0300	0.029	0.191							0.281	0.637	0.764	0.098	0.197	0.040
42	1/16/2009	8:40:00	0.0444	0.043	0.051	0.007	0.070	0.033				-0.058	1.110	1.524	0.315	0.200	0.146
43	1/16/2009	8:45:00	0.0092	0.032	0.032							-0.242	0.869	2.491	0.347	0.180	0.231
44	1/16/2009	8:50:00	0.0250	0.031	0.041							0.443	0.980	1.183	0.624	0.141	0.213
45	1/16/2009	8:55:00	0.0177	0.033	0.037							0.612	0.701	0.856	0.040	0.203	0.033
46	1/16/2009	9:00:00	0.0444	0.039	0.052	0.060	0.230	0.240	0.005	0.046	0.043	0.657	1.060	1.284	0.384	0.169	0.245
47	1/16/2009	9:05:00	0.0731	0.048	0.080							0.464	0.982	1.177	0.431	0.190	0.183
48	1/16/2009	9:10:00	0.0548	0.026	0.040							0.824	0.935	1.141	0.405	0.155	0.192
49	1/16/2009	9:15:00	0.0648	0.025	0.051	0.150	0.220	0.220	-0.012	0.014	0.037	0.454	0.871	1.051	0.176	0.156	0.218
50	1/16/2009	9:20:00	-0.0356	0.023	0.026							1.313	0.674	0.879	0.200	0.158	0.143
51	1/16/2009	9:25:00	-0.0325	0.038	0.328							-0.150	0.901	1.880	0.115	0.179	0.136
52	1/16/2009	9:30:00	0.0811	0.036	0.049							0.001	1.040	1.221	0.165	0.195	0.098
53	1/16/2009	9:35:00	0.0623	0.023	0.039							-0.029	0.943	1.229	0.250	0.150	0.122
		mean	0.026			0.067			-0.004			0.328			0.229		
		std dev	0.042			0.060			0.009			0.413			0.180		
		median	0.021			0.055			-0.006			0.410			0.231		

Abbreviations and Acronyms:

- ¹³⁷Cs – cesium-137
- MDA – minimum detectable activity
- pCi/g – picocuries per gram
- ²³⁹Pu – plutonium-239
- ²²⁶Ra – radium-226
- ⁹⁰Sr – strontium-90
- std dev – standard deviation
- ²³²Th – thorium-232

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**TABLE 9-6
BUILDING 351A SURVEY UNIT U SAMPLING SUMMARY**

Class 2 Soil Measurements - Building 351A - Survey Unit U

Sample No.	Date	Time	Results (pCi/g)														
			¹³⁷ Cs	MDA	2σ Total	⁹⁰ Sr	MDA	2σ Total	²³⁹ Pu	MDA	2σ Total	²²⁶ Ra	MDA	2σ Total	²³² Th	MDA	2σ Total
01	1/17/2009	10:00:00	-0.0069	0.027	0.039							0.234	0.754	0.906	-0.056	0.190	0.037
02	1/17/2009	10:10:00	0.0003	0.026	0.026	0.007	0.069	0.032				-0.221	0.727	2.985	-0.495	0.170	3.833
03	1/17/2009	10:20:00	0.0560	0.022	0.042							-0.017	0.964	-1.180	0.216	0.162	0.138
04	1/17/2009	10:30:00	0.0136	0.040	0.063							0.958	0.821	1.021	0.125	0.161	0.092
05	1/17/2009	10:40:00	0.0446	0.041	0.049							0.790	0.941	1.146	0.244	0.196	0.125
06	1/16/2009	10:50:00	-0.0008	0.030	0.032							0.091	0.740	0.878	0.116	0.172	0.065
07	1/17/2009	11:00:00	0.1004	0.023	0.044							-0.310	0.889	3.263	0.191	0.153	0.128
08	1/17/2009	11:10:00	0.0581	0.036	0.046							-0.323	1.040	3.194	0.161	0.181	0.115
09	1/17/2009	11:20:00	-0.0364	0.030	3.534							0.527	0.776	0.951	0.304	0.204	0.161
10	1/17/2009	11:30:00	-0.0348	0.039	0.408	.100	0.260	0.250	-0.016	0.016	0.043	0.000	0.896	1.058	0.227	0.196	0.138
11	1/17/2009	11:40:00	0.0582	0.017	0.032							-0.016	0.720	-0.872	0.238	0.140	0.181
12	1/17/2009	11:50:00	-0.0053	0.040	0.053							1.193	0.912	1.141	0.162	0.204	0.114
13	1/17/2009	12:30:00	0.0989	0.025	0.051							0.413	0.910	1.095	0.297	0.162	0.155
14	1/17/2009	12:40:00	0.0067	0.033	0.041							-0.054	0.964	-1.320	0.401	0.154	0.229
15	1/17/2009	12:50:00	0.0551	0.039	0.048							0.403	1.030	1.224	0.096	0.220	0.075
16	1/17/2009	13:00:00	-0.0008	0.028	0.032	0.11	0.24	0.25	-0.008	0.011	0.029	0.054	0.998	1.187	0.623	0.114	0.163
17	1/17/2009	13:10:00	0.0141	0.028	0.035							-0.153	0.940	-1.661	0.094	0.155	0.093
18	1/17/2009	13:20:00	-0.0253	0.034	0.142	0.035	0.056	0.037	-0.004	0.009	0.024	1.055	0.852	1.054	0.330	0.142	0.128
19	1/17/2009	13:30:00	0.0190	0.031	0.035							0.185	0.652	0.776	-0.122	0.169	0.096
20	1/17/2009	13:40:00	0.0161	0.038	0.042							0.101	0.837	0.990	0.187	0.199	0.114
		mean	0.022			0.063			-0.009			0.246			0.167		
		std dev	0.040			0.050			0.006			0.451			0.221		
		median	0.014			0.068			-0.008			0.096			0.189		

Abbreviations and Acronyms:
¹³⁷Cs – cesium-137
MDA – minimum detectable activity
pCi/g – picocuries per gram
²³⁹Pu – plutonium-239
²²⁶Ra – radium-226
⁹⁰Sr – strontium-90
std dev – standard deviation
²³²Th – thorium-232

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**TABLE 9-7
BUILDING 351A SURVEY UNIT T (TRENCH) SAMPLING SUMMARY**

Class 1 Soil Measurements - Building 351A - Survey Unit T

Sample No.	Date	Time	Results (pCi/g)														
			¹³⁷ Cs	MDA	2σ Total	⁹⁰ Sr	MDA	2σ Total	²³⁹ Pu	MDA	2σ Total	²²⁶ Ra	MDA	2σ Total	²³² Th	MDA	2σ Total
47	1/12/2009	10:20:00	-0.0005	0.031	0.128							-0.009	0.988	1.208	0.391	0.165	0.228
48	1/12/2009	10:28:00	0.0238	0.040	0.044							0.815	1.080	1.313	0.047	0.211	0.044
49	1/12/2009	10:38:00	-0.0403	0.029	0.678	-0.010	0.150	0.170	-0.004	0.007	0.020	0.573	0.597	0.767	-0.163	0.189	0.113
50	1/12/2009	10:44:00	0.0366	0.041	0.048							0.197	1.130	1.337	0.079	0.215	0.049
51	1/12/2009	10:52:00	-0.0262	0.032	0.137							0.163	0.676	0.827	-0.358	0.173	0.452
52	1/12/2009	11:00:00	0.0179	0.034	0.037							0.510	0.768	0.927	-0.200	0.202	1.567
53	1/12/2009	11:08:00	0.0233	0.028	0.037							-0.200	0.897	-1.857	0.162	0.145	0.101
54	1/12/2009	11:16:00	0.0320	0.040	0.047							-0.235	0.781	2.205	-0.031	0.194	0.099
55	1/12/2009	11:24:00	0.0657	0.028	0.044	0.038	0.073	0.045				-0.151	0.919	1.889	0.178	0.151	0.116
56	1/12/2009	11:32:00	0.0126	0.016	0.021							0.230	0.860	1.015	0.117	0.153	0.096
57	1/12/2009	11:40:00	-0.0323	0.047	0.294							0.432	1.180	1.423	0.221	0.202	0.306
58	1/12/2009	11:48:00	0.0218	0.053	0.063							0.676	1.060	1.288	0.125	0.214	0.072
59	1/12/2009	12:40:00	-0.0081	0.033	0.053	0.220	0.220	0.210	0.014	0.060	0.053	-0.168	0.755	1.528	0.182	0.133	0.262
60	1/12/2009	12:48:00	0.0164	0.034	0.044							-0.293	0.944	-2.398	0.129	0.162	0.082
61	1/12/2009	12:56:00	0.0880	0.041	0.055							-0.222	1.110	2.271	-0.137	0.218	0.506
62	1/12/2009	13:04:00	0.0059	0.028	0.034							-0.008	0.963	-1.155	0.290	0.165	0.103
63	1/12/2009	1:12:00	0.0441	0.035	0.042	0.100	0.170	0.170	-0.016	0.016	0.042	-0.284	0.781	2.441	-0.109	0.197	0.417
64	1/12/2009	1:20:00	-0.0061	0.039	0.053							0.641	0.803	0.979	0.042	0.199	0.024
		mean	0.015			0.087			-0.002			0.148			0.054		
		std dev	0.033			0.099			0.015			0.375			0.189		
		median	0.017			0.069			-0.004			0.078			0.098		

Abbreviations and Acronyms:

- ¹³⁷Cs – cesium-137
- MDA – minimum detectable activity
- pCi/g – picocuries per gram
- ²³⁹Pu – plutonium-239
- ²²⁶Ra – radium-226
- ⁹⁰Sr – strontium-90
- std dev – standard deviation
- ²³²Th – thorium-232

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**TABLE 9-8
BUILDING 351A LABORATORY RESULTS COMPARISON (pCi/g)**

Survey Unit	Sample ID	On-site Laboratory										Off-site Laboratory (QA)									
		Count Time (min)	²²⁸ Ac			¹³⁷ Cs			²²⁶ Ra			Count Time (min)	²²⁸ Ac			¹³⁷ Cs			²²⁶ Ra		
			Activity	MDA	2σ Error	Activity	MDA	2σ Error	Activity	MDA	2σ Error		Activity	MDL	2σ Error	Activity	MDL	2σ Error	Activity	MDL	2σ Error
A	Bldg351A-A-01	45	0.176	0.116	0.157	0.059	0.019	0.036	-0.127	0.727	-1.158	30	-0.030	0.150	0.190	0.005	0.052	0.055	0.025	0.089	0.096
	Bldg351A-A-05	45	0.129	0.083	0.116	0.043	0.028	0.042	0.068	0.756	0.858	30	0.120	0.120	0.170	0.000	0.052	0.063	0.190	0.100	0.130
	Bldg351A-A-06	45	0.386	0.090	0.161	0.080	0.021	0.044	0.342	0.710	0.831	30	0.150	0.150	0.210	0.011	0.038	0.048	0.215	0.036	0.091
	Bldg351A-A-08	45	0.337	0.081	0.165	0.052	0.027	0.041	-0.344	0.922	-1.812	30	0.090	0.150	0.210	0.009	0.036	0.047	-0.030	0.120	0.280
B	Bldg351A-B-04	45	0.396	0.095	0.193	0.050	0.025	0.041	-0.372	0.718	-1.896	30	0.050	0.190	0.240	-0.010	0.070	0.110	0.070	0.110	0.140
	Bldg351A-B-08	45	0.351	0.078	0.165	0.040	0.031	0.043	-0.069	0.901	-1.138	30	-0.090	0.180	0.240	-0.008	0.043	0.054	0.250	0.070	0.120
	Bldg351A-B-11	45	0.324	0.090	0.177	0.046	0.022	0.037	0.676	0.745	0.889	30	0.100	0.140	0.200	-0.050	0.080	2.000	0.240	0.080	0.140
	Bldg351A-B-15	45	0.158	0.090	0.110	0.069	0.018	0.037	0.438	0.710	0.840	30	0.070	0.110	0.160	0.010	0.022	0.031	0.056	0.059	0.078
C	Bldg351A-C-04	45	0.327	0.070	0.126	0.071	0.024	0.043	-0.387	0.658	-1.761	30	0.260	0.120	0.210	0.026	0.043	0.058	0.250	0.070	0.120
	Bldg351A-C-10	45	0.422	0.110	0.211	0.013	0.039	0.049	1.090	1.020	1.236	30	0.050	0.150	0.190	-0.030	0.060	0.330	0.110	0.090	0.110
	Bldg351A-C-12	45	0.234	0.222	0.198	0.006	0.033	0.041	0.997	0.959	1.119	30	0.150	0.170	0.230	-0.050	0.070	1.300	0.390	0.100	0.190
	Bldg351A-C-16	45	0.215	0.112	0.149	0.047	0.020	0.036	-0.067	0.681	-0.874	30	0.060	0.110	0.150	-0.004	0.035	0.043	0.200	0.070	0.110
D	Bldg351A-D-01	45	0.431	0.110	0.232	0.045	0.040	0.054	0.482	1.010	1.181	30	0.180	0.150	0.230	0.001	0.050	0.060	0.110	0.100	0.130
	Bldg351A-D-07	45	0.240	0.070	0.140	0.076	0.033	0.052	0.325	0.683	0.784	30	0.090	0.130	0.180	-0.040	0.060	0.380	0.190	0.070	0.110
	Bldg351A-D-09	45	0.219	0.220	0.300	0.028	0.045	0.058	0.855	0.839	1.270	30	0.130	0.120	0.180	-0.018	0.044	0.056	0.290	0.070	0.130
	Bldg351A-D-13	45	0.447	0.116	0.184	0.068	0.023	0.042	0.749	0.847	1.028	30	0.200	0.180	0.260	-0.010	0.057	0.090	0.090	0.110	0.130
E	Bldg351A-E-03	45	0.419	0.095	0.194	0.041	0.037	0.043	-0.760	0.929	-2.817	30	0.110	0.150	0.200	-0.020	0.050	0.130	0.008	0.088	0.092
	Bldg351A-E-06	45	0.530	0.107	0.249	0.068	0.023	0.041	-0.285	1.040	-2.014	30	0.120	0.120	0.170	-0.008	0.033	0.042	0.098	0.067	0.088
	Bldg351A-E-11	45	0.382	0.116	0.198	0.050	0.022	0.037	0.550	0.730	0.877	30	0.180	0.120	0.180	-0.004	0.030	0.037	0.089	0.069	0.095
	Bldg351A-E-12	45	0.227	0.098	0.164	0.073	0.024	0.043	-0.116	0.795	-1.210	30	0.140	0.160	0.220	-0.030	0.060	0.260	0.210	0.070	0.120
F	Bldg351A-F-02	45	0.141	0.097	0.109	0.067	0.024	0.041	-0.010	0.644	-0.746	30	0.150	0.110	0.170	0.008	0.033	0.042	0.033	0.068	0.084
	Bldg351A-F-08	45	0.252	0.100	0.185	0.048	0.041	0.050	-0.428	0.947	-1.787	30	0.170	0.190	0.260	0.007	0.044	0.055	0.120	0.100	0.130
	Bldg351A-F-10	45	0.306	0.118	0.160	0.062	0.025	0.042	-0.106	0.672	-0.980	30	0.120	0.120	0.170	-0.040	0.050	24.000	0.150	0.090	0.130
	Bldg351A-F-11	90	0.441	0.096	0.204	0.037	0.024	0.033	1.079	0.633	0.767	30	0.150	0.100	0.160	-0.004	0.038	0.047	0.101	0.058	0.085
G	Bldg351A-G-02	45	0.307	0.100	0.179	0.058	0.028	0.055	0.358	0.714	0.842	30	0.270	0.170	0.140	0.004	0.047	0.058	0.350	0.060	0.130
	Bldg351A-G-09	45	0.384	0.064	0.151	0.053	0.032	0.047	-0.094	0.662	-0.931	30	0.070	0.110	0.150	-0.040	0.050	4.100	0.070	0.090	0.110
	Bldg351A-G-10	45	0.587	0.110	0.214	0.033	0.043	0.056	1.307	0.944	1.156	30	0.350	0.130	0.220	0.025	0.031	0.044	0.490	0.030	0.130
	Bldg351A-G-14	45	0.166	0.180	0.138	0.002	0.030	0.036	0.987	0.794	0.948	30	0.120	0.130	0.180	0.000	0.029	0.035	0.000	0.090	0.097
H	Bldg351A-H-06	45	0.289	0.202	0.126	0.004	0.032	0.040	1.099	0.879	1.056	30	0.220	0.140	0.220	0.010	0.040	0.051	0.100	0.100	0.130
	Bldg351A-H-08	45	0.329	0.087	0.152	0.045	0.038	0.046	0.181	0.899	1.067	30	0.160	0.090	0.160	-0.020	0.050	0.130	0.280	0.090	0.160
	Bldg351A-H-10	45	0.415	0.064	0.157	0.087	0.017	0.040	0.343	0.662	0.768	30	0.000	0.110	0.140	-0.030	0.060	0.400	0.130	0.100	0.130
	Bldg351A-H-12	45	0.400	0.172	0.205	0.020	0.017	0.027	0.002	0.804	0.914	30	0.200	0.130	0.210	-0.040	0.060	0.900	0.370	0.080	0.160
I	Bldg351A-I-04	45	0.259	0.202	0.122	0.001	0.011	0.007	0.993	0.860	1.027	30	0.170	0.090	0.150	0.009	0.037	0.046	0.050	0.090	0.110
	Bldg351A-I-09	45	0.341	0.084	0.139	-0.017	0.043	-0.065	0.871	0.773	0.952	30	0.360	0.140	0.170	0.026	0.030	0.044	0.200	0.080	0.120
	Bldg351A-I-10	45	0.355	0.064	0.142	0.047	0.030	0.044	0.257	0.741	0.861	30	0.110	0.130	0.190	-0.030	0.060	0.380	0.220	0.060	0.110
	Bldg351A-I-14	45	0.374	0.105	0.150	0.019	0.044	0.049	1.159	0.971	1.199	30	0.150	0.120	0.180	-0.002	0.026	0.032	0.460	0.050	0.140
J	Bldg351A-J-01	45	0.290	0.159	0.226	0.042	0.038	0.052	0.292	0.991	1.161	30	0.160	0.140	0.210	0.000	0.014	0.012	0.030	0.100	0.110
	Bldg351A-J-05	45	0.427	0.075	0.162	0.049	0.041	0.050	0.764	0.884	1.065	30	0.040	0.140	0.180	-0.040	0.060	0.780	0.170	0.070	0.110
	Bldg351A-J-08	90	0.223	0.077	0.138	0.023	0.022	0.029	-0.278	0.705	-1.332	30	0.530	0.040	0.200	0.000	0.049	0.059	0.160	0.060	0.100
	Bldg351A-J-14	45	0.412	0.064	0.156	0.019	0.018	0.027	0.218	0.687	0.791	30	0.110	0.140	0.200	0.000	0.014	0.012	0.150	0.090	0.120
K	Bldg351A-K-02	45	0.121	0.200	0.064	0.025	0.033	0.043	1.148	0.997	1.203	30	0.110	0.150	0.210	-0.040	0.050	0.460	0.150	0.090	0.120

**TABLE 9-8
BUILDING 351A LABORATORY RESULTS COMPARISON (pCi/g)**

Survey Unit	Sample ID	On-site Laboratory									Off-site Laboratory (QA)										
		Count Time (min)	²²⁸ Ac			¹³⁷ Cs			²²⁶ Ra			Count Time (min)	²²⁸ Ac			¹³⁷ Cs			²²⁶ Ra		
			Activity	MDA	2σ Error	Activity	MDA	2σ Error	Activity	MDA	2σ Error		Activity	MDL	2σ Error	Activity	MDL	2σ Error	Activity	MDL	2σ Error
	Bldg351A-K-11	45	0.461	0.084	0.143	-0.024	0.046	-0.090	0.734	0.716	0.873	30	0.120	0.160	0.220	-0.050	0.060	0.630	0.290	0.080	0.140
	Bldg351A-K-13	45	0.291	0.133	0.209	0.019	0.039	0.042	0.937	0.762	0.931	30	0.140	0.120	0.180	-0.022	0.051	0.065	0.060	0.100	0.130
	Bldg351A-K-15	45	0.015	0.202	0.014	0.013	0.033	0.042	1.159	0.873	1.053	30	0.040	0.120	0.150	0.009	0.050	0.054	0.050	0.100	0.120
L	Bldg351A-L-04	45	0.276	0.103	0.201	0.008	0.039	0.048	1.306	0.726	0.926	30	0.060	0.160	0.210	0.037	0.029	0.046	0.110	0.100	0.120
	Bldg351A-L-05	45	0.261	0.188	0.120	0.054	0.039	0.048	-0.245	1.080	-2.209	30	0.200	0.120	0.200	0.019	0.050	0.056	0.260	0.060	0.120
	Bldg351A-L-07	45	0.557	0.064	0.177	0.024	0.021	0.031	0.553	0.697	0.829	30	0.200	0.130	0.200	-0.020	0.050	0.160	0.050	0.100	0.110
	Bldg351A-L-10	45	0.465	0.106	0.231	0.047	0.044	0.058	0.738	0.996	1.190	30	0.180	0.140	0.220	-0.020	0.050	0.140	0.270	0.070	0.130
M	Bldg351A-M-05	45	0.203	0.199	0.263	0.057	0.030	0.045	0.376	0.869	1.019	30	0.160	0.120	0.190	0.012	0.032	0.043	0.310	0.070	0.140
	Bldg351A-M-07	45	0.652	0.101	0.232	0.069	0.024	0.042	1.105	0.793	0.991	30	0.250	0.210	0.290	-0.007	0.055	0.068	0.380	0.080	0.170
	Bldg351A-M-11	90	0.420	0.103	0.204	0.009	0.025	0.031	0.790	0.696	0.833	30	0.200	0.110	0.170	-0.006	0.039	0.049	0.440	0.070	0.130
N	Bldg351A-N-01	45	0.186	0.084	0.111	0.024	0.039	0.040	0.676	0.583	0.708	30	0.110	0.120	0.180	-0.009	0.043	0.058	0.153	0.064	0.095
	Bldg351A-N-02	45	0.226	0.064	0.109	0.042	0.011	0.028	0.023	0.714	0.812	30	0.080	0.150	0.190	0.005	0.039	0.048	0.271	0.034	0.098
	Bldg351A-N-09	90	0.270	0.162	0.147	0.725	0.029	0.078	1.373	0.685	0.836	30	0.160	0.130	0.190	0.780	0.030	0.130	0.370	0.070	0.130
	Bldg351A-N-10	45	0.375	0.138	0.244	0.081	0.025	0.044	0.665	0.858	1.034	30	0.170	0.120	0.170	0.021	0.040	0.052	0.400	0.080	0.150
O	Bldg351A-O-02	45	0.534	0.096	0.229	0.036	0.033	0.045	0.407	1.040	1.222	30	0.000	0.050	0.043	-0.020	0.050	0.120	0.330	0.060	0.130
	Bldg351A-O-03	45	0.468	0.075	0.169	-0.020	0.046	-0.113	1.130	0.937	1.157	30	0.160	0.130	0.200	0.000	0.074	0.089	0.080	0.100	0.120
	Bldg351A-O-07	45	0.295	0.090	0.168	0.045	0.025	0.038	0.989	0.761	0.937	30	0.040	0.160	0.200	-0.020	0.060	0.170	0.095	0.064	0.082
	Bldg351A-O-16	45	0.191	0.134	0.099	-0.014	0.044	-0.064	1.007	0.763	0.949	30	0.150	0.160	0.230	0.000	0.073	0.088	0.240	0.070	0.140
P	Bldg351A-P-01	45	0.626	0.121	0.264	0.075	0.034	0.051	-0.846	1.080	-8.474	30	-0.001	0.200	0.240	-0.020	0.060	0.190	0.010	0.090	0.100
	Bldg351A-P-03	45	0.203	0.145	0.131	0.046	0.030	0.044	0.308	0.696	0.809	30	0.170	0.160	0.240	0.003	0.048	0.058	0.270	0.060	0.120
	Bldg351A-P-12	45	0.212	0.078	0.136	0.093	0.021	0.043	-0.316	0.683	-1.707	30	0.070	0.150	0.200	0.067	0.037	0.050	-0.040	0.100	0.280
	Bldg351A-P-13	45	0.671	0.103	0.261	0.019	0.035	0.045	1.098	0.893	1.084	30	0.100	0.130	0.190	-0.001	0.031	0.038	0.250	0.060	0.110
R	72351A-S000R-F066-01	45	0.462	0.155	0.227	0.002	0.027	0.033	0.971	0.949	1.165	30	0.460	0.100	0.180	-0.001	0.039	0.048	0.350	0.070	0.130
	72351A-S000R-F071-01	90	0.269	0.100	0.134	0.053	0.023	0.033	-0.031	0.662	0.871	30	0.000	0.140	0.170	0.011	0.046	0.058	0.300	0.040	0.110
S	72351A-S000S-F050-01	45	0.200	0.158	0.144	-0.036	0.023	0.026	1.313	0.674	0.883	30	0.450	0.110	0.170	-0.004	0.049	0.042	0.480	0.060	0.150
	72351A-S000S-F052-01	45	0.165	0.195	0.099	0.081	0.036	0.049	0.001	1.040	1.221	30	0.420	0.070	0.130	0.015	0.036	0.046	0.280	0.060	0.100
T	Bldg351A-T-01	45	0.440	0.155	0.311	0.063	0.040	0.056	0.814	1.050	1.265	30	0.007	0.170	0.210	0.017	0.056	0.063	0.190	0.080	0.120
	Bldg351A-T-03	45	0.299	0.086	0.170	0.042	0.025	0.038	0.582	0.763	0.912	30	0.120	0.110	0.170	-0.019	0.044	0.058	0.008	0.100	0.100
	Bldg351A-T-05	45	0.130	0.141	0.081	0.031	0.020	0.031	0.622	0.615	0.732	30	0.000	0.050	0.043	-0.050	0.050	0.700	-0.020	0.100	0.180
	Bldg351A-T-15	45	0.212	0.131	0.120	0.034	0.021	0.032	-0.143	0.743	-1.197	30	0.140	0.180	0.250	-0.021	0.053	0.068	0.050	0.100	0.120
	72351A-S000T-F055-01	45	0.178	0.151	0.116	0.066	0.028	0.044	-0.151	0.919	1.889	30	0.070	0.120	0.170	0.012	0.028	0.038	0.081	0.070	0.094
	72351A-S000T-F061-01	45	-0.137	0.218	0.506	0.088	0.041	0.055	-0.222	1.110	2.271	30	0.020	0.150	0.190	-0.050	0.050	0.940	0.005	0.100	0.120
U	72351A-S000U-F004-01	45	0.125	0.161	0.093	0.014	0.040	0.063	0.958	0.821	1.023	30	0.380	0.080	0.160	0.037	0.028	0.041	0.210	0.070	0.110
	72351A-S000U-F012-01	45	0.162	0.204	0.115	-0.005	0.040	0.053	1.193	0.912	1.143	30	0.340	0.130	0.240	0.000	0.061	0.074	0.320	0.070	0.150

**TABLE 9-8
BUILDING 351A LABORATORY RESULTS COMPARISON (pCi/g)**

	Sample ID	Count Time (min)	On-site Laboratory						Off-site Laboratory (QA)						
			²¹⁴ Bi			²¹⁴ Pb			Count Time (min)	²¹⁴ Bi			²¹⁴ Pb		
			Activity	MDA	2σ Error	Activity	MDA	2σ Error		Activity	MDL	2σ Error	Activity	MDL	2σ Error
	Bldg351A-A-01	45	0.124	0.038	0.080	0.014	0.046	0.059	30	0.025	0.089	0.096	-0.020	0.100	0.200
	Bldg351A-A-05	45	0.447	0.053	0.135	0.233	0.089	0.129	30	0.190	0.100	0.130	0.330	0.070	0.120
	Bldg351A-A-06	45	0.087	0.083	0.090	0.319	0.060	0.137	30	0.215	0.036	0.091	0.400	0.020	0.110
	Bldg351A-A-08	45	0.407	0.071	0.143	0.217	0.083	0.123	30	-0.030	0.120	0.280	0.290	0.070	0.120
B	Bldg351A-B-04	45	0.287	0.058	0.131	0.015	0.099	0.029	30	0.070	0.110	0.140	0.260	0.070	0.120
	Bldg351A-B-08	45	0.274	0.076	0.119	0.296	0.092	0.179	30	0.250	0.070	0.120	0.300	0.060	0.130
	Bldg351A-B-11	45	0.334	0.051	0.121	0.223	0.102	0.153	30	0.240	0.080	0.140	0.210	0.100	0.140
	Bldg351A-B-15	45	0.229	0.034	0.091	0.234	0.054	0.114	30	0.056	0.059	0.078	0.080	0.058	0.084
C	Bldg351A-C-04	45	0.328	0.067	0.152	0.090	0.089	0.085	30	0.250	0.070	0.120	0.290	0.050	0.110
	Bldg351A-C-10	45	0.429	0.106	0.215	0.375	0.094	0.181	30	0.110	0.090	0.110	0.143	0.064	0.097
	Bldg351A-C-12	45	0.463	0.093	0.196	0.524	0.102	0.156	30	0.390	0.100	0.190	0.510	0.090	0.190
	Bldg351A-C-16	45	0.190	0.044	0.079	0.168	0.087	0.138	30	0.200	0.070	0.110	0.280	0.060	0.100
Survey Unit A	Bldg351A-D-01	45	0.346	0.079	0.142	0.242	0.077	0.124	30	0.110	0.100	0.130	0.290	0.080	0.110
	Bldg351A-D-07	45	0.394	0.066	0.161	0.088	0.094	0.080	30	0.190	0.070	0.110	0.198	0.057	0.097
	Bldg351A-D-09	45	0.327	0.074	0.150	0.206	0.099	0.147	30	0.290	0.070	0.130	0.308	0.069	0.096
	Bldg351A-D-13	45	0.363	0.044	0.117	0.408	0.050	0.120	30	0.090	0.110	0.130	0.170	0.110	0.140
E	Bldg351A-E-03	45	0.419	0.055	0.136	0.336	0.082	0.149	30	0.008	0.088	0.092	0.162	0.063	0.092
	Bldg351A-E-06	45	0.329	0.063	0.130	0.221	0.072	0.122	30	0.098	0.067	0.088	0.290	0.050	0.110
	Bldg351A-E-11	45	0.510	0.029	0.122	-0.001	0.066	243.340	30	0.089	0.069	0.095	0.250	0.040	0.100
	Bldg351A-E-12	45	0.216	0.045	0.088	0.313	0.105	0.154	30	0.210	0.070	0.120	0.188	0.052	0.089
F	Bldg351A-F-02	45	0.199	0.036	0.085	0.146	0.051	0.081	30	0.033	0.068	0.084	0.135	0.059	0.093
	Bldg351A-F-08	45	0.397	0.072	0.146	0.438	0.092	0.162	30	0.120	0.100	0.130	0.190	0.100	0.100
	Bldg351A-F-10	45	0.434	0.050	0.140	0.315	0.087	0.157	30	0.150	0.090	0.130	0.160	0.080	0.130
	Bldg351A-F-11	90	0.364	0.063	0.126	0.186	0.058	0.087	30	0.101	0.058	0.085	0.292	0.027	0.097
G	Bldg351A-G-02	45	0.312	0.042	0.111	0.267	0.047	0.102	30	0.350	0.060	0.130	0.370	0.080	0.150
	Bldg351A-G-09	45	0.257	0.067	0.155	0.160	0.080	0.105	30	0.070	0.090	0.110	0.038	0.076	0.088
	Bldg351A-G-10	45	0.434	0.101	0.201	0.458	0.086	0.168	30	0.490	0.030	0.130	0.440	0.050	0.140
	Bldg351A-G-14	45	0.191	0.054	0.103	0.265	0.078	0.135	30	0.000	0.090	0.097	0.084	0.078	0.097
H	Bldg351A-H-06	45	0.315	0.069	0.113	0.281	0.094	0.133	30	0.100	0.100	0.130	0.300	0.060	0.120
	Bldg351A-H-08	45	0.546	0.047	0.149	0.397	0.089	0.141	30	0.280	0.090	0.160	0.240	0.070	0.120
	Bldg351A-H-10	45	0.243	0.072	0.103	0.266	0.084	0.153	30	0.130	0.100	0.130	0.210	0.100	0.140
	Bldg351A-H-12	45	0.526	0.086	0.220	0.239	0.094	0.136	30	0.370	0.080	0.160	0.310	0.070	0.130
I	Bldg351A-I-04	45	0.239	0.063	0.120	0.253	0.079	0.134	30	0.050	0.090	0.110	0.174	0.031	0.083
	Bldg351A-I-09	45	0.356	0.038	0.110	0.333	0.059	0.118	30	0.200	0.080	0.120	0.290	0.070	0.130
	Bldg351A-I-10	45	0.418	0.074	0.147	0.144	0.088	0.107	30	0.220	0.060	0.110	0.250	0.070	0.110
	Bldg351A-I-14	45	0.571	0.058	0.158	0.643	0.109	0.209	30	0.460	0.050	0.140	0.630	0.050	0.160
J	Bldg351A-J-01	45	0.394	0.089	0.173	0.229	0.070	0.118	30	0.030	0.100	0.110	0.142	0.058	0.094
	Bldg351A-J-05	45	0.461	0.040	0.126	0.329	0.089	0.159	30	0.170	0.070	0.110	0.240	0.052	0.089
	Bldg351A-J-08	90	0.255	0.059	0.113	0.045	0.060	0.093	30	0.160	0.060	0.100	0.304	0.027	0.090
	Bldg351A-J-14	45	0.190	0.060	0.113	0.141	0.083	0.111	30	0.150	0.090	0.120	0.170	0.070	0.110

**TABLE 9-8
BUILDING 351A LABORATORY RESULTS COMPARISON (pCi/g)**

	Sample ID	Count Time (min)	On-site Laboratory						Off-site Laboratory (QA)						
			²¹⁴ Bi			²¹⁴ Pb			Count Time (min)	²¹⁴ Bi			²¹⁴ Pb		
			Activity	MDA	2σ Error	Activity	MDA	2σ Error		Activity	MDL	2σ Error	Activity	MDL	2σ Error
K	Bldg351A-K-02	45	0.418	0.058	0.137	0.289	0.081	0.128	30	0.150	0.090	0.120	0.310	0.060	0.130
	Bldg351A-K-11	45	0.452	0.039	0.121	0.503	0.054	0.140	30	0.290	0.080	0.140	0.250	0.080	0.130
	Bldg351A-K-13	45	0.355	0.053	0.132	0.336	0.081	0.126	30	0.060	0.100	0.130	0.158	0.050	0.066
	Bldg351A-K-15	45	0.379	0.058	0.124	0.244	0.076	0.111	30	0.050	0.100	0.120	0.052	0.076	0.090
L	Bldg351A-L-04	45	0.398	0.037	0.126	0.362	0.044	0.107	30	0.110	0.100	0.120	0.200	0.070	0.130
	Bldg351A-L-05	45	0.456	0.047	0.131	0.399	0.088	0.165	30	0.260	0.060	0.120	0.250	0.050	0.100
	Bldg351A-L-07	45	0.228	0.081	0.164	0.168	0.077	0.129	30	0.050	0.100	0.110	0.100	0.080	0.110
	Bldg351A-L-10	45	0.580	0.070	0.159	0.477	0.094	0.185	30	0.270	0.070	0.130	0.290	0.090	0.150
M	Bldg351A-M-05	45	0.370	0.070	0.149	0.311	0.086	0.143	30	0.310	0.070	0.140	0.400	0.070	0.130
	Bldg351A-M-07	45	0.566	0.062	0.171	0.517	0.051	0.128	30	0.380	0.080	0.170	0.550	0.080	0.150
	Bldg351A-M-11	90	0.409	0.062	0.106	0.144	0.068	0.087	30	0.440	0.070	0.130	0.250	0.070	0.110
N	Bldg351A-N-01	45	0.325	0.031	0.108	0.194	0.050	0.083	30	0.153	0.064	0.095	0.250	0.060	0.110
	Bldg351A-N-02	45	0.153	0.045	0.079	0.054	0.079	0.069	30	0.271	0.034	0.098	0.166	0.056	0.065
	Bldg351A-N-09	90	0.482	0.048	0.091	0.207	0.068	0.086	30	0.370	0.070	0.130	0.460	0.080	0.150
	Bldg351A-N-10	45	0.315	0.067	0.134	0.289	0.097	0.127	30	0.400	0.080	0.150	0.270	0.070	0.130
O	Bldg351A-O-02	45	0.436	0.073	0.158	0.202	0.070	0.124	30	0.330	0.060	0.130	0.280	0.060	0.120
	Bldg351A-O-03	45	0.444	0.057	0.152	0.275	0.073	0.115	30	0.080	0.100	0.120	0.320	0.080	0.110
	Bldg351A-O-07	45	0.414	0.060	0.147	0.250	0.088	0.127	30	0.095	0.064	0.082	0.080	0.090	0.110
	Bldg351A-O-16	45	0.387	0.052	0.131	0.413	0.057	0.128	30	0.240	0.070	0.140	0.320	0.060	0.120
P	Bldg351A-P-01	45	0.333	0.086	0.171	0.375	0.088	0.174	30	0.010	0.090	0.100	0.096	0.067	0.088
	Bldg351A-P-03	45	0.407	0.050	0.129	0.185	0.093	0.121	30	0.270	0.060	0.120	0.380	0.050	0.120
	Bldg351A-P-12	45	0.291	0.049	0.114	0.105	0.072	0.087	30	-0.040	0.100	0.280	0.141	0.072	0.072
	Bldg351A-P-13	45	0.295	0.094	0.188	0.259	0.088	0.137	30	0.250	0.060	0.110	0.370	0.050	0.110
R	72351A-S000R-F066-01	45	0.394	0.051	0.108	0.350	0.094	0.122	30	0.350	0.070	0.130	0.430	0.080	0.120
	72351A-S000R-F071-01	90	0.477	0.042	0.108	0.434	0.045	0.084	30	0.300	0.040	0.110	0.340	0.060	0.120
S	72351A-S000S-F050-01	45	0.298	0.036	0.097	0.415	0.053	0.108	30	0.480	0.060	0.150	0.380	0.070	0.140
	72351A-S000S-F052-01	45	0.314	0.081	0.315	0.214	0.109	0.141	30	0.280	0.060	0.100	0.300	0.060	0.110
T	Bldg351A-T-01	45	0.435	0.075	0.153	0.350	0.086	0.162	30	0.190	0.080	0.120	0.220	0.070	0.120
	Bldg351A-T-03	45	0.318	0.057	0.124	0.202	0.089	0.123	30	0.008	0.100	0.100	0.350	0.060	0.120
	Bldg351A-T-05	45	0.201	0.047	0.095	0.107	0.086	0.104	30	-0.020	0.100	0.180	0.035	0.084	0.098
	Bldg351A-T-15	45	0.322	0.057	0.129	0.310	0.093	0.118	30	0.050	0.100	0.120	0.100	0.080	0.110
	72351A-S000T-F055-01	45	0.319	0.043	0.115	0.256	0.057	0.108	30	0.081	0.070	0.094	0.118	0.053	0.087
	72351A-S000T-F061-01	45	0.447	0.055	0.139	0.122	0.114	0.172	30	0.005	0.100	0.120	-0.010	0.080	0.110
U	72351A-S000U-F004-01	45	0.378	0.043	0.112	0.176	0.077	0.111	30	0.210	0.070	0.110	0.300	0.070	0.120
	72351A-S000U-F012-01	45	0.421	0.064	0.139	0.479	0.096	0.150	30	0.320	0.070	0.150	0.630	0.080	0.160

Notes:
Information concerning flags associated with the on-site laboratory data can be found in Section 6.8.2.1 of this report, and a discussion of uncertainty can be found in Section 4.8 of the Survey Unit Project Reports Abstract (TTEC 2010). Values in red exceed the release criteria for that radionuclide of concern.

Abbreviations and Acronyms:
²²⁸Ac – actinium-228 MDA – minimum detectable activity ²¹⁴Pb – lead-214 ²²⁶Ra – radium-226
²¹⁴Bi – bismuth-214 MDL – method detection limit pCi/g – picocuries per gram
¹³⁷Cs – cesium-137 min – minutes QA – quality assurance

10.0 DOSE MODELING

The intent of the Building 351A survey is to achieve unrestricted release for the building and the crawl space area. To accomplish this goal, it is necessary to provide a means for calculating residual dose to the critical group. To calculate the residual dose, the residential scenario in RESRAD-BUILD Version 3.5 was selected for the interior survey units, and the residential farmer scenario in RESRAD Version 6.5 was used for the crawl space area.

10.1 MODELING INTERIOR BUILDING SURFACES

For Class 1 and Class 2 survey units where the net mean activity of both alpha and beta was less than zero, the residual dose was determined to be 0.00 mrem/y, with no additional increase in ELCR. No other dose or risk modeling for these survey units was determined to be reasonable or prudent.

Where the net alpha or beta activity was less than background, these values were not used in dose or risk modeling.

For interior surfaces, default RESRAD-BUILD Version 3.5 parameters were used to model the net residual radioactivity with two exceptions. In assigning a removable fraction for building surfaces, a number of factors must be taken into account. In a decommissioned and decontaminated building, any residual contamination might be expected to be predominantly fixed because decontamination efforts should have used reasonable steps in cleaning the building. The NRC specifies a maximum acceptable removable concentration of 10 percent of the average surface concentrations for all radionuclides (NRC 2000). The Base-wide Plan Revision 1 (TtEC 2007) specifies a maximum acceptable removable concentration of 20 percent of the average surface concentrations for all radionuclides. Therefore, the removable fraction was set at 20 percent. Additionally, the actual surface area of each survey unit was used.

The net mean activities were taken from the data presented in Appendix D.

A summary of the final dose and risk input to RESRAD-BUILD Version 3.5 is presented in Table 10-1. The RESRAD-BUILD Version 3.5 dose and risk summary sheets are presented in Appendix L. The maximum dose was identified in Survey Unit 47 at 0.202 mrem/y with an ELCR of 1.34×10^{-7} .

10.2 MODELING OF CRAWL SPACE SURVEY UNITS

Two separate models were used to ensure that the residual dose was sufficiently less than the acceptable EPA Office of Solid Waste and Emergency Response Directive 9200.4-18 of an ELCR in the range of 10^{-4} to 10^{-6} (nominally 15 mrem/y). Because the on-site laboratory was

capable of calculating actual survey data, the first model provided input parameters that were based on the on-site laboratory data, even if the data were less than the MDL. The second set of modeling input parameters provided that if the reported activity was less than the MDL, then the MDL was used.

Each set of parameters was input into RESRAD Version 6.5 to determine the ELCR and residual dose to the critical group. The default RESRAD Version 6.5 parameters were used for the crawl space area with only three exceptions: 1) the actual surface area of the survey unit was used; 2) the distance of the length parallel to the aquifer was changed; and 3) the net concentrations above background were used. Additionally, lead-210 was modeled at an identical activity to the ²²⁶Ra activity to ensure that all possible exposures were considered.

Table 10-2 shows the results of dose modeling if concentrations of ¹³⁷Cs, ²³⁹Pu, ²²⁶Ra, ⁹⁰Sr, and ²³²Th and from using the actual activity were replaced with the MDL value if the reported activity was less than the MDL. The activity used to model each radionuclide is based on the isotopic net concentration. This approach was used to determine the maximum possible dose that one would expect to receive if the reported activities were actually at the MDL.

The maximum dose and ELCR when using reported activity results greater than zero were 0.732 mrem/y with an ELCR of 1.43×10^{-5} (Survey Unit M). The maximum dose and ELCR when using the higher of the reported activity or the MDL were 3.005 mrem/y with an ELCR of 6.01×10^{-5} (Survey Unit D).

**TABLE 10-1
BUILDING 351A INTERIOR AREAS DOSE AND RISK MODELING SUMMARY**

Survey Unit	Area (m ²)	Alpha Mean (dpm _{NET} /100 cm ²)	Beta Mean (dpm _{NET} /100 cm ²)	Dose (mrem/y)	Risk (ELCR)
1	14.63	-1.17	-142.50		
2	28.47	-3.40	67.56	0.020	1.23E-08
3	42.87	-3.10	-8.68		
5	57.86	-9.71	-57.37		
6	12.60	-2.30	241.63	0.061	3.59E-08
7	75.22	-0.91	29.10	0.010	6.55E-09
8	26.44	-2.58	48.16	0.014	8.59E-09
9	69.59	0.18	-112.29	0.021	1.38E-09
10	69.65	-1.53	-111.36		
11	24.00	-4.05	-15.54		
12	67.00	-1.68	-17.19		
13	92.34	-4.05	-80.16		
14	44.00	-2.79	-134.88		
16	22.01	-2.61	-214.71		
18	23.30	-1.29	76.52	0.022	1.32E-08
19	52.04	-3.34	-154.23		
20	56.35	-4.16	-133.28		
21	63.64	-5.52	-111.93		
22	54.85	-3.40	54.73	0.018	1.15E-08
23	42.28	-1.75	45.61	0.015	9.05E-09
24	31.38	-3.81	-169.89		
25	49.56	-2.52	-127.53		
26	57.05	-7.81	13.18	0.004	2.79E-09
27	60.70	-2.39	83.64	0.029	1.79E-08
29	16.24	-3.28	-95.68		
30	54.39	-2.21	-75.44		
31	30.13	-2.12	30.07	0.009	5.51E-09
32	94.69	-3.00	-93.66		
33	94.56	-1.95	-53.63		
34	14.46	-1.10	82.86	0.022	1.27E-08
35	22.60	-2.39	11.29	0.003	1.94E-09
36	55.06	-8.62	42.80	0.014	9.00E-09
37	12.52	-4.09	-191.67		
38	13.68	-2.61	-157.14		
39	13.95	-1.89	-191.52		
40	95.61	-2.57	-26.69		
41	43.38	1.10	41.59	0.141	1.67E-08
42	89.64	-4.50	-340.65		
43	14.93	-1.49	-164.07		
44	14.13	-3.98	-35.37		
45	990.41	-0.42	-68.91		
46	871.58	-4.54	-25.14		
47	826.14	-2.02	400.29	0.202	1.34E-07

Abbreviations and Acronyms:

cm² – square centimeter

DPM_{NET} – net disintegrations per minute

ELCR – excess lifetime cancer risk

m² – square meter

mrem/y – millirems per year

**TABLE 10-2
BUILDING 351A CRAWL SPACE AREA DOSE AND RISK MODELING SUMMARY**

Survey Unit	Area (m ²)	Activity (pCi/g)					Dose (mrem/y)	Risk (ELCR)
		¹³⁷ Cs	⁹⁰ Sr	²³⁹ Pu	²²⁶ Ra	²³² Th		
A	100.00	0.034	0.130	0.011			0.109	1.58E-06
B	100.00	0.037	0.151				0.122	1.77E-06
C	100.00	0.039	0.010				0.067	1.08E-06
D	100.00	0.028	0.123	0.008			0.097	1.39E-06
E	100.00	0.043	0.058	0.013			0.094	1.44E-06
F	100.00	0.024		0.003			0.039	6.31E-07
G	100.00	0.034		0.004			0.055	8.94E-07
H	100.00	0.031	0.045	0.003			0.069	1.05E-06
I	100.00	0.012	0.045	0.008			0.038	5.54E-07
J	100.00	0.014					0.023	3.68E-07
K	100.00	0.021	0.073				0.064	9.38E-07
L	100.00	0.020	0.103	0.013			0.076	1.07E-06
M	100.00	0.028	0.125	0.004	0.099		0.732	1.43E-05
O	100.00	0.013	0.080	0.006			0.055	7.65E-07
P	100.00	0.031	0.103	0.001			0.093	1.36E-06
R	90.95	0.018	0.022				0.037	5.72E-07
S	64.20	0.026	0.067				0.057	8.72E-07
T	53.00	0.015	0.087				0.042	6.11E-07
U	79.90	0.022	0.063				0.055	8.27E-07

Survey Unit	Area (m ²)	Residual Activity ≥ MDA (pCi/g)					Dose (mrem/y)	Risk (ELCR)
		¹³⁷ Cs	⁹⁰ Sr	²³⁹ Pu	²²⁶ Ra	²³² Th		
A	100.00	0.044	0.178	0.019	0.401		2.718	5.42E-05
B	100.00	0.047	0.213	0.018	0.409		2.788	5.55E-05
C	100.00	0.049	0.158	0.017	0.421		2.846	5.69E-05
D	100.00	0.047	0.163	0.019	0.446		3.005	6.01E-05
E	100.00	0.050	0.153	0.022	0.379		2.576	5.14E-05
F	100.00	0.035	0.148	0.014	0.341		2.306	4.60E-05
G	100.00	0.048	0.158	0.016	0.367		2.498	4.98E-05
H	100.00	0.045	0.165	0.014	0.334		2.284	4.55E-05
I	100.00	0.043	0.170	0.014	0.386		2.616	5.22E-05
J	100.00	0.037	0.145	0.015	0.340		2.301	4.59E-05
K	100.00	0.040	0.183	0.016	0.409		2.765	5.52E-05
L	100.00	0.040	0.148	0.021	0.393		2.648	5.29E-05
M	100.00	0.047	0.163	0.018	0.379		2.575	5.14E-05
O	100.00	0.039	0.153	0.016	0.398		2.680	5.36E-05
P	100.00	0.043	0.170	0.018	0.329		2.251	4.48E-05
R	90.95	0.041	0.052	0.020	0.450		2.893	5.85E-05
S	64.20	0.047	0.198	0.034	0.457		2.729	5.58E-05
T	53.00	0.040	0.034	0.004	0.421		2.363	4.90E-05
U	79.90	0.045	0.196	0.011	0.415		2.634	5.32E-05

Notes:

In all instances, the net MDA activity for ^{232}Th was less than zero.

Abbreviations and Acronyms:

^{137}Cs – cesium-137

ELCR – excess lifetime cancer risk

m^2 – square meter

MDA – minimum detectable activity

mrem/y – millirems per year

pCi/g – picocuries per gram

^{239}Pu – plutonium-239

^{226}Ra – radium-226

^{90}Sr – strontium-90

^{232}Th – thorium-232

11.0 AS LOW AS REASONABLY ACHIEVABLE

As low as reasonably achievable (ALARA) is a philosophy of striving for excellence in the practice of health physics and is an important aspect of radiation-safety regulations. The National Council on Radiation Protection and Measurements has stated “ALARA is simply the continuation of good radiation-protection programs and practices which traditionally have been effective in keeping the average and individual exposures for monitored workers well below the limits” (NCRP 1993). The application of ALARA clearly includes the consideration of economic and social factors, and thus will inherently be different for different sources or facilities.

The ALARA concept is founded in the professional judgment of radiation-safety managers and personnel and is not, therefore, able to be used as a measure as to whether or not a particular radiation-safety program is adequate in comparison with other programs. Additionally, the ALARA concept does not provide a numerical limit below which the ALARA concept is achieved.

11.1 ENVIRONMENTAL ALARA PROCESS

This section describes the steps taken to implement the environmental ALARA policy:

- Identification of Potential Radiological Impacts
- Review of Radiological Impacts
- Performance of Qualitative ALARA Analyses
- Performance of Quantitative ALARA Analyses

11.1.1 Identification of Potential Radiological Impacts

Building 351A was subjected to ALARA reviews before work began to ensure that radiation exposures to workers, the public, and the environment met ALARA principles. ALARA reviews were conducted for all operations, practices, and procedures that have potential for individual or collective doses to workers. Reviews culminated in changes or additions to work planning documents, SOPs, and radiological work permits.

These documents were used to identify activities that have potential for radiological environmental impacts and could require environmental ALARA analysis. If a radiological impact was identified that could impact the environment significantly, the RSO communicated the impact to the work staff and the RASO.

11.1.2 Review of Radiological Impacts

Radiological impacts to the environment, workers, and the public from field operations were assessed for compliance with ALARA principles. Results from radiological survey activities, and air, swipe, and soil samples were used to assess the radiological impacts of the Building 351A activities.

Environmental radiological impacts from radiological activities were determined using eight methods: 1) field monitoring and sampling to identify areas that may require remediation; 2) control of the radiologically impacted building; 3) air monitoring during remedial actions; 4) frisking of personnel and examining equipment leaving the radiologically controlled area; 5) use of release criteria that equate to dose and risk; 6) review of historical radiological operations to allow investigation of Building 351A; 7) characterization of Building 351A to ensure complete removal of radioactive material above the release criteria, if identified; and 8) dosimetry worn by personnel to measure time-averaged doses from gamma radiation.

11.1.3 Performance of Qualitative ALARA Analyses

Data analyses are performed for alpha, beta, and gamma radiation to ensure that any possible radioactive contamination has been identified. After survey activities had been completed, the qualitative radiological impacts from operations were assessed by performing a dose and risk assessment. The results of analysis and assessments are provided to the RASO and regulatory agencies for review.

11.1.4 Performance of Quantitative ALARA Analyses

Based on qualitative ALARA analyses, site survey projects that could cause the potential dose to the public to exceed 1 millirem (individual) or 10 person-rem (collective) are subjected to quantitative ALARA analyses using the steps described below. To date, no operations at HPS have resulted in an individual dose to the public greater than 1 mrem or a collective dose greater than 10 person-rem.

Quantitative ALARA analyses include societal, technological, economic, and public policy considerations. In addition, these ALARA analyses consider NRC guidance for performing the following environmental ALARA assessments:

- Identification of possible radiation protection systems, such as alternative operating methods or controls that are reasonably achievable. The options range from the most rudimentary (base case) to the most technologically sophisticated systems.
- Quantification of exposures and doses to workers and the public in the vicinity of the work through air monitoring and dosimetry.
- Quantification of the economic factors, including the costs of purchasing, installing, operating, and maintaining the radiological equipment, and the potential health effects

associated with the exposure of people and any other direct or indirect cost resulting from exposures to radiation during investigations and/or remediations.

- Identification and estimation of other health and nonhealth detriments and benefits, such as equipment loss and accidents.
- Evaluation of process alternatives using a quantitative cost-benefit analysis, when possible. When evaluations included assumptions, judgments, and limitations that could be quantified, and potential doses were well below the dose limit, qualitative analyses were used with full documentation.
- Implementation of the ALARA principles and monitoring of the results.

The following specific factors were used in performing a quantitative ALARA analysis:

- Dose to workers, the public, and the environment before and during work processes
- Residual dose to the local population
- Applicable alternative processes (treatments, operating methods, or controls) for site investigations or remediations
- Costs for each alternative evaluated
- Societal and environmental (positive and negative) impacts associated with alternatives

Based on recent estimates of dose to the public from the Building 351A survey work, only qualitative ALARA analyses were required. Much of the data and analysis used for environmental ALARA evaluations was developed as part of the routine work processes.

Qualitative ALARA analyses resulted in no alpha or beta measurements above the investigation levels; none of the alpha, beta, or gamma measurement results identified activity above the release criteria for any ROC; and no personnel dosimetry badges processed identified gamma dose above background levels.

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12.0 CONCLUSION

Building 351A is a vacant, one-story, concrete building constructed over a crawl space that abuts the south end of Building 351. It is located between Cochrane and Morrell Streets within Parcel G at HPS in San Francisco, California. Building 351A has approximately 35,166 square feet (3447.6 m²) of floor space.

Building 351A was considered radiologically impacted due to its use as a radiation detection equipment shop and facility where other instruments were calibrated, repaired, and reconditioned. The NRDL also used Building 351A as a chemistry laboratory. The ROCs were ¹³⁷Cs, ²³⁹Pu, ²²⁶Ra, ⁹⁰Sr, and ²³²Th. These radionuclides cover alpha, beta, and gamma emitters that could be present inside Building 351A.

In March 1955, the NRDL consolidated most of its facilities into Building 815 and surveyed the buildings it formerly used for free release to the shipyard's use and control. Surveys were conducted in Buildings 313, 313A, 322, 351, 351A, 366 (formerly known as 351B), 506, 507, 508, and 510. The NRDL release letters confirm that these buildings were surveyed and released for unrestricted use in 1955 (with the exception of the drain lines) during the transfer of operations to Building 815. No site-specific survey or decontamination procedure was found for the 1955 NRDL surveys. However, under existing AEC guidelines, all NRDL buildings were required to be thoroughly surveyed and decontaminated prior to abandonment or release for unrestricted use. For final clearance, former NRDL facilities were required to meet the residual contamination levels established by the Naval Bureau of Medicine and Surgery for decontamination of Navy facilities and equipment.

In August of 1974, the DON performed additional surveys inside the building and found beta contamination in a sink and associated drain lines in Workroom 47, which was subsequently removed. No additional decontamination efforts were recorded.

The DON also performed cursory alpha, beta/gamma, and gamma scans surveys in 1992 as part of a surface contamination radiation survey. No detectable activity was found in the building. The DON returned in 1997 to survey the drain lines in Workroom 47 for removable alpha and beta activity, but no residual contamination was detected above acceptable surface contamination activity levels for the period.

In the first quarter of 2001, NWT discovered an area of elevated activity. Tile and molding were removed and analyzed by gamma spectroscopy. A disc, later identified as containing ²²⁶Ra, was also removed from the building. In June and July of 2001, a 100 percent gamma walkover survey was performed inside the building, and 1 minute static gamma measurements were obtained from the building and from a section of the drain piping from the sink in Workroom 47.

Swipes for alpha and beta/gamma removable contamination were obtained from the open ends of the drain line from Workroom 47. A 10 percent gamma walkover survey was performed in accessible portions of the attic. In addition, a leaded enclosure was discovered and found to contain loose contamination above the release criteria of this period.

In March 2002, NWT mobilized to perform a Class 3 survey of Building 351A. Elevated readings were again identified in some floor areas. The drain piping was further investigated, found to have contamination, and subsequently removed. All drain pipes from the building drained to a central line located in the crawl space. After all piping was removed from the crawl space area, surveys were performed.

Following research performed for the HRA, the survey was later considered insufficient for the DON to recommend unrestricted release, based on the initial Class 3 classification. In spring 2008, the DON determined that there were areas inside the crawl space beneath the structure that required some remedial actions, the leaded enclosure required removal, and the ventilation system required a scoping survey. The DON directed TtEC to perform a scoping survey of the ventilation system and to retrieve the crawl space samples from NWT's archive for reanalysis. Additionally, the DON directed TtEC to remove the leaded enclosure for disposal as LLRW by the DON's authorized waste broker.

The search through the sample archive produced all but one of the original samples from 2002. These samples were repackaged and reanalyzed by the on-site laboratory. The missing sample was from the trench area and had indicated the presence of elevated ^{137}Cs activity. Because the initial 2002 analysis of the missing sample indicated elevated ^{137}Cs activity, the DON decided to remediate the affected area.

The ventilation survey involved sampling and scanning all ventilation system openings from below. The results of this survey did not indicate any elevated measurements.

In the fall of 2008, TtEC and its subcontractors began performing the FSS. The FSS was designed in accordance with MARSSIM (NUREG-1575; DoD et al. 2000). To perform the survey, Building 351A was initially divided into 44 Class 1 interior survey units on the main floor, 17 Class 1 survey units in the crawl space, a single Class 2 survey unit around a prospective remediation area in the crawl space, and a single Class 1 survey unit for the trench area. The floors and walls that were less than or equal to 2 meters above the respective floor areas were divided into Class 1 survey units. However, after asbestos abatement and remedial actions were completed, there were 40 Class 1 survey units on the main floor, 19 Class 1 and 1 Class 2 survey units in the crawl space, and a single Class 1 survey unit for the trench area.

Survey methods for the main floor included fixed static (direct) and scan surface contamination surveys for alpha and beta radiation. Static and scan measurements were performed for gamma

radiation. Exposure rate measurements were performed at static reading locations. Additionally, swipe samples were obtained to evaluate the presence of loose alpha and beta-gamma radiation.

Elevated activity was identified during the survey activities in Survey Units 7, 26, and 43. Remediation was performed and systematic samples were collected and analyzed. No activity above the release limits was identified in the systematic samples.

Remediation activities were performed in the crawl space prior to performing the FSS. The FSS survey methods in the crawl space included fixed static (direct) and scan measurements for gamma radiation. Exposure rate measurements were performed at static reading locations. Additionally, soil samples were obtained to evaluate the presence of any of the applicable ROCs. No elevated activity above the release criteria was identified in the systematic soil samples.

An evaluation of the survey results and modeling efforts confirmed that all doses from these survey units (including building and crawl space) indicated a maximum of 0.202 mrem/y and a maximum ELCR (increase) of 1.34×10^{-7} (in Survey Unit 47 in the building), and 0.732 mrem/y with an ELCR of 1.43×10^{-5} (in Survey Unit M in the crawl space area). Based on these results, the DON recommends Building 351A for unrestricted release.

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EXHIBIT 7



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Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

July 20, 2018

The SF Shipyard HOA
c/o 11 Innes Court
San Francisco, CA 94124

Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update

For the week of July 16, the CDPH Radiological Health Branch (RHB) has completed the following Walkover Scanning Surveys:

- 4 survey units completely scanned
- 50% complete of a fifth survey unit

These include the areas in the center of Innes Court, most of the areas to the southeast (i.e., past the end of the Court), and part of the area to the northeast. No anomalies have been discovered in the above scanning surveys.

In addition, RHB has completed approximately 75% of street scanning using the Towed Array RS 700, except for these three streets: LaSalle, Kirkwood, and Innes Court. Those streets will be scanned in the following week. Staff will need to analyze the collected data from the RS 700 before we know if any anomalies have been detected. Data analysis for this week's collected data should take about two weeks.

CDPH greatly appreciates residents' compliance with the requests to not park vehicles on designated streets to facilitate this survey effort. Thank you for all of your assistance and patience.

As always, questions or comments about this project can be sent to:

RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health





KAREN L. SMITH, MD, MPH
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EDMUND G. BROWN JR.
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July 27, 2018

The SF Shipyard HOA
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Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update #2

For the week of July 23, the CDPH Radiological Health Branch (RHB) has completed the following Walkover Scanning Surveys:

- 1 survey unit 90% scanned
- 2 survey units two-thirds scanned
- 1 survey unit 10% scanned

These include the south-southwest to south-southeast areas of Innes Court, most of the areas to the southeast (i.e., past the end of the Court), and part of the area to the northeast. In total, about 15-20% of the walkover survey area has been completed (the pace of these surveys will increase as the process becomes more routine and staff from the Towed Array are able to assist).

A total of eleven anomalies slightly above background action levels were detected during this week's surveys and all were from potassium-40, a naturally occurring substance (about 0.01% of potassium found in nature, including in plants, animals and our bodies, is potassium-40). Two anomalies were found in a "clover" patch next to an utility access panel, one was detected around a sod area next to a sprinkler unit, three were detected in grassy areas, and five were found to be from woodchips.

In addition, RHB is continuing to make progress with the Towed Array RS 700 and has now completed approximately 90% of street scanning. As indicated last week, staff will need to analyze the collected data from the RS 700 before we know if any anomalies



have been detected. Data analysis for this week's collected data should take about two weeks.

CDPH greatly appreciates residents' assistance to facilitate this survey effort.

As always, questions or comments about this project can be sent to:
RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Starr". The signature is fluid and cursive, with a prominent horizontal stroke at the end.

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

August 3, 2018

The SF Shipyard HOA
c/o 11 Innes Court
San Francisco, CA 94124

Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update #3

For the week of July 30, the CDPH Radiological Health Branch (RHB) conducted Walkover Scanning Surveys in 5 survey units. These include areas northwest of Innes Court, the area to the east, and the area just south of Innes Court. In total, about 20% of the walkover survey area has been completed. One anomaly, slightly above background, was detected during this week's surveys. It was determined to be potassium-40, the same naturally occurring substance detected last week, located just north of Innes Court on the corner of a building.

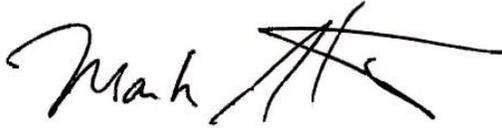
In addition, RHB is continuing to make progress with the Towed Array RS 700 and has now completed over 95% of street scanning. There are a few isolated spots that the RS 700 will need to go back to scan due to construction zones or parked vehicle obstruction. As indicated in previous updates, Towed Array RS 700 staff is now concentrating on data analysis. The first step in data analysis, now underway, is to organize the large volume of data collected into manageable subsets that can then be accessed by various radiological analytical software. Once the data is organized and can be accessed by software, analysis can proceed. As soon as the first set of data is analyzed, any anomaly findings will be reported in upcoming Progress Updates.

CDPH greatly appreciates residents' assistance to facilitate this survey effort.



As always, questions or comments about this project can be sent to:
RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Starr". The signature is stylized with a large, sweeping "M" and a long horizontal stroke extending to the right.

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

August 10, 2018

The SF Shipyard HOA
c/o 11 Innes Court
San Francisco, CA 94124

Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update #4

For the week of August 6, the CDPH Radiological Health Branch (RHB) conducted Walkover Scanning Surveys in 12 survey units, located along and around Hill Drive and the hill side areas on Hill Drive. Of these 12 survey units, 5 are complete and the remainder are in various stages of completion. Nine anomalies, slightly above background, were detected in this week's surveys, and all were determined to be potassium-40, the same naturally occurring substance detected last week. These findings are not unusual for a neighborhood scan and do not pose a hazard to people or the environment (about 0.01% of potassium found in nature, including in plants, animals and our bodies, is potassium-40). In total, approximately 25% of the walkover survey area has been completed.

In addition, RHB has completed the street scanning with the Towed Array RS 700. As indicated in previous updates, Towed Array RS 700 staff is now concentrating on data analysis. Preliminary analysis indicates that some anomalies were detected by this instrument as well, and that they were also all derived from naturally occurring radioactive isotopes. Further data analysis will be conducted in the coming weeks to confirm these findings.



CDPH greatly appreciates residents' assistance to facilitate this survey effort.

As always, questions or comments about this project can be sent to:
RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Starr". The signature is fluid and cursive, with a prominent horizontal stroke at the end.

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

August 17, 2018

The SF Shipyard HOA
c/o 11 Innes Court
San Francisco, CA 94124

Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update #5

For the week of August 13, the CDPH Radiological Health Branch (RHB) continues to make progress on the Walkover Scanning Surveys and has completed 13 survey units, located on the north sidewalks of Galvez Avenue (including the sidewalks and the surrounding area of the convenience store and Lennar construction office), the adjacent hillside areas, and along Hudson Avenue and Avocet Way. Of the area scanned during this week, two anomalies were detected, both slightly above background and both determined to be potassium-40. One was detected outside of an engineering trailer (Lennar construction office) and the other in the landscape area of a building on Hudson Avenue. As mentioned in last week's Progress Update, these findings are not unusual for a neighborhood scan and do not pose a hazard to people or the environment (approximately 0.01% of potassium found in nature, including in plants, animals and our bodies, is potassium-40). In total, approximately 30% of the walkover survey area has been completed.



In addition, RHB is continuing on the data analysis of the Towed Array RS 700 data sets. As pointed out in the last Progress Update, preliminary analysis showed that some anomalies were detected by the RS 700, and that they were also derived from naturally occurring radioactive isotopes. We are continuing our efforts to confirm these findings.

CDPH continues to appreciate residents' assistance to facilitate this survey effort.

As always, questions or comments about this project can be sent to:
RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Starr". The signature is stylized with a large, sweeping initial "M" and a long horizontal stroke extending to the right.

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

August 24, 2018

The SF Shipyard HOA
c/o 11 Innes Court
San Francisco, CA 94124

Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update #6

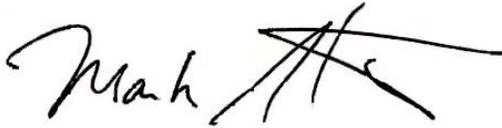
For the week of August 20, the CDPH Radiological Health Branch (RHB) completed four survey units on the Walkover Scanning Surveys and that brings the total area completed for the walkover survey to approximately 50%. The four survey units scanned this past week were located on the south sidewalks of Galvez Avenue and the northwest of Innes Court around the bus stop. Of these areas scanned, one anomaly, slightly above background, was detected along the sidewalk of Galvez Avenue close to the Lennar Construction Trailer. Like the previous anomalies detected, it was determined to be potassium-40, a naturally occurring substance. As stated in previous updates, detection of a naturally occurring substance above background is not unusual for a neighborhood scan and does not pose a hazard to people or the environment (approximately 0.01% of potassium found in nature, including in plants, animals and our bodies is potassium-40).

In addition, the data analysis of the Towed Array RS 700 data sets continues.



CDPH appreciates residents' assistance to facilitate this survey effort. As always, questions or comments about this project can be sent to:
RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Starr". The signature is stylized with a large, sweeping flourish that extends to the right.

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

August 31, 2018

The SF Shipyard HOA
c/o 11 Innes Court
San Francisco, CA 94124

Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update #7

For the week of August 27, the CDPH Radiological Health Branch completed five survey units and most of a sixth survey unit on the Walkover Scanning Surveys. This brings the total area completed for the walkover survey to approximately 65%. The six survey units scanned this past week were located on the west side of Donahue Street and northeast of Innes Avenue, the park along Donahue between Building 49 and 50, the area around Galvez and Robinson Street, and the areas along Friedell Street.

Within these scanned areas, five anomalies, slightly above background, were detected and all were determined to be potassium-40, a naturally occurring substance. As stated in previous updates, detection of a naturally occurring substance above background is not unusual for a neighborhood scan and does not pose a hazard to people or the environment (approximately 0.01% of potassium found in nature, including in plants, animals and our bodies is potassium-40). One anomaly was found in the parking field, just west of Donahue Street, and another was found in the field east of the guard station on Galvez Ave, with the remaining three found around Building 51 on Friedell Street.



In addition, the data analysis of the Towed Array RS 700 data sets continues.

CDPH appreciates residents' assistance to facilitate this survey effort. As always, questions or comments about this project can be sent to:

RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Starr". The signature is stylized with a large, sweeping flourish that extends to the right.

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health



KAREN L. SMITH, MD, MPH
Director and State Public Health Officer

State of California—Health and Human Services Agency
California Department of Public Health



EDMUND G. BROWN JR.
Governor

September 13, 2018

The SF Shipyard HOA
c/o 11 Innes Court
San Francisco, CA 94124

Hunters Point Naval Shipyard Parcel A-1, Radiation Health and Safety Scanning Survey: Progress Update #8

Note: This update includes both the regular update for work during the week of September 3-7 as well as related follow-up information from early this week.

At the end of the week of September 3, the CDPH Radiologic Health Branch had completed approximately 70% of the Walkover Scanning Survey areas of Parcel A-1. In total, the Parcel A-1 survey project is over 90% completed, with the exception of areas currently under construction that will be completed at a later date. The nine survey units scanned this past week were located around Building 101, the Galvez Hill area, and the southwest hillside area. Of these areas scanned, a total of eight anomalies were detected.

One of these anomalies, which was detected by CDPH's Walkover Scanning Survey on September 7th, was determined early this week to be a naval deck marker 1.5 inches in diameter that contained radium. The deck marker was located just west of the Department of Public Works (DPW) trailer, at the bottom of the hill on the north side of parcel A-1, in an undeveloped area behind a fence. On Tuesday, September 11th, the Navy's contractor, under CDPH observation, removed the deck marker from below about 10" of soil. The hole which contained the deck marker and removed soil were scanned and no radiation above background was found (i.e., all of the detected radiation was only in the deck marker itself).

Radiation readings before removal indicate that there would not have been any health or safety hazard to anyone who happened to be at that spot previously. CDPH scanning instrumentation is quite sensitive, and able to detect radiation well below levels that might be harmful. All agencies/entities involved with Parcel A-1 continue to coordinate regarding the follow-up for this finding. CDPH will meet with residents to



answer any questions about this finding.

The remaining anomalies were determined to be potassium-40: Three anomalies, slightly above background, were detected around Building 101 and all three were determined to be potassium-40, a naturally occurring substance that does not pose a hazard to people or the environment. Two anomalies, also slightly above background and also identified as potassium-40, were detected around the southwest hillside area. Additionally, two other anomalies were detected in a non-residential area around the DPW trailer and the GF Construction trailer and were identified as potassium-40.

As always, CDPH appreciates residents' assistance to facilitate this survey effort. Additional questions or comments about this project can be sent to:

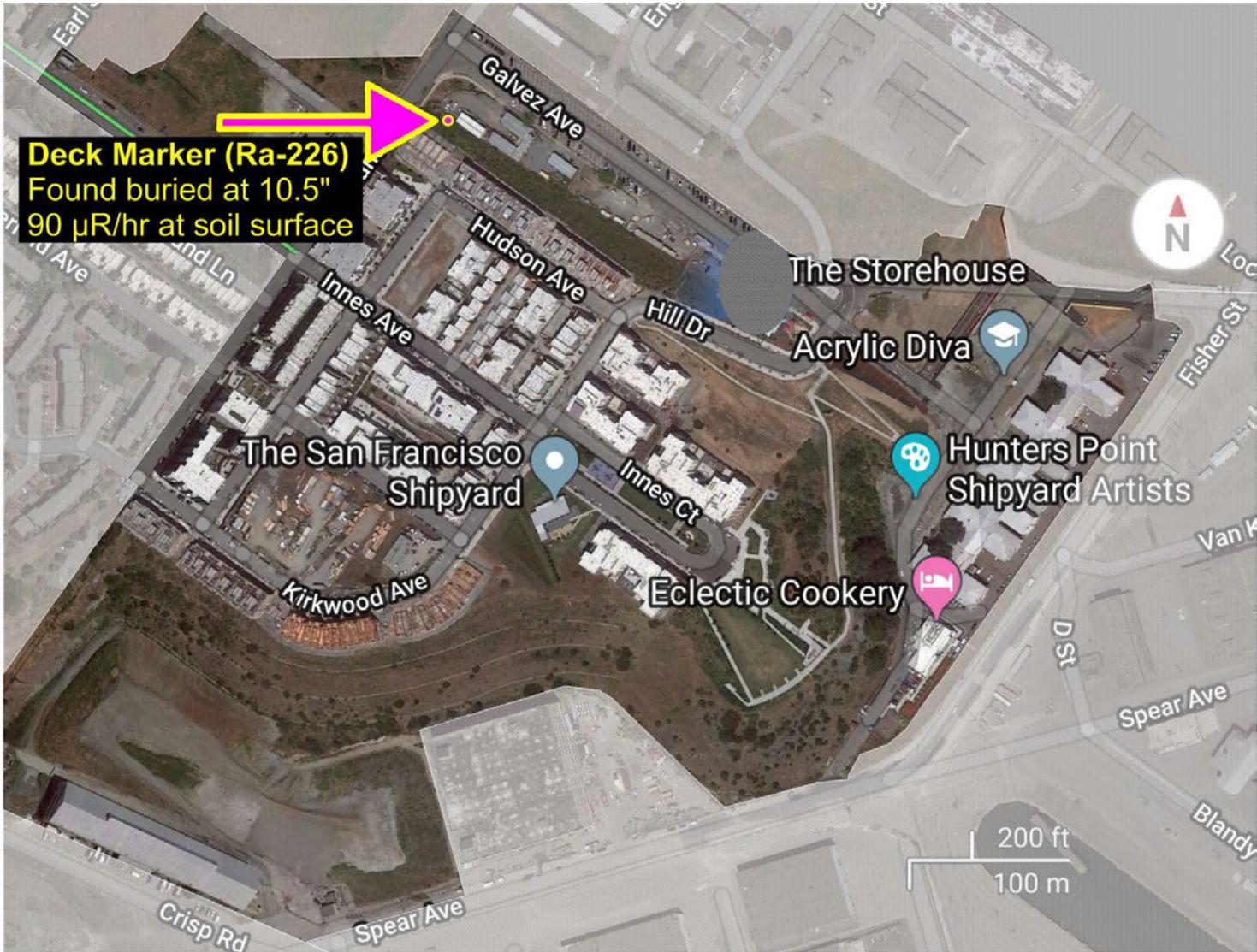
RHBHuntersPointParcelAScan@cdph.ca.gov

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Starr". The signature is fluid and cursive, with a prominent horizontal stroke at the end.

Mark Starr, DVM, MPVM, DACVPM
Deputy Director for Environmental Health
California Department of Public Health





Deck Marker (Ra-226)
Found buried at 10.5"
90 μ R/hr at soil surface

The Storehouse

Acrylic Diva

The San Francisco Shipyard

Hunters Point Shipyard Artists

Eclectic Cookery

200 ft
100 m

EXHIBIT 8

IN THE SUPERIOR COURT OF UNION COUNTY
STATE OF GEORGIA

STATE OF GEORGIA
UNION COUNTY
I, Judy L. Odom, Superior Court Clerk,
Union County Georgia, do hereby
certify that the within is a true and
correct copy as appears on record
in this office.

INDICTMENT

Judy L. Odom
Judy L. Odom, Superior Court Clerk

STATE OF GEORGIA

CASE NUMBER:

17CR221SG

VS

CHARGE(S):

ANTHONY JAMES SMITH

- Ct. 1: TERRORISTIC THREATS
O.C.G.A. 16-11-37(b)
- Ct. 2: BATTERY, FAMILY VIOLENCE
O.C.G.A. 16-5-23.1(f)
- Ct. 3: BATTERY
O.C.G.A. 16-5-23.1
- Ct. 4: SIMPLE BATTERY, FAMILY
VIOLENCE
O.C.G.A. 16-5-23(f)
- Ct. 5: SIMPLE BATTERY
O.C.G.A. 16-5-23
- Ct. 6: SIMPLE ASSAULT, FAMILY
VIOLENCE
O.C.G.A. 16-5-20(d)
- Ct. 7: SIMPLE ASSAULT
O.C.G.A. 16-5-20
- Ct. 8: HINDERING EMERGENCY
TELEPHONE CALL
O.C.G.A. 16-10-24.3

FILED IN OFFICE THIS 7th DAY OF
September 2017 AT 12:37 P
M
Judy L. Odom
Superior Court Clerk Union County

July Term 2017

TRUE

Bill

[Signature]

Foreperson

PROSECUTOR:

Doug Brackett, 17055741, Union County Sheriff's Office

WITNESSES:

Deputy Doug Brackett, Union County Sheriff's Office, Union County Sheriff's Office, 348 Beasley Road, Blairsville, GA 30512, Main Office: 706-439-6066, Fax: 706-439-6068

Brandon Hogsed, Union County Sheriff's Office, Union County Sheriff's Office, 348 Beasley Road, Blairsville, GA 30512, Main Office: 706-439-6066, Fax: 706-439-6068

Jenny Rhodes, Union County Sheriff's Office, Union County Sheriff's Office, 348 Beasley Road, Blairsville, GA 30512, Main Office: 706-439-6066, Fax: 706-439-6068

Susan Kimberly Spears, **Current 101 S. Main Street, Suite 8-341, Hiawassee, GA 30546 and 7577 West Union Road, Young Harris, GA 30582 and 3153 Baldview Drive, Hiawassee, GA 30546 and 846 Hunt Rd., Se, Cleveland, TN 37323 and 112 Woodwind Drive, Rockmart, GA 30153, Home Phone: 678-332-6742, Cell Phone: **Current 706-666-3155, Cell Phone: 706-994-2715, Cell Phone: 678-246-8618

===== PLEA =====

The Defendant herein waives formal Arraignment,
Indictment by grand jury and Pleads:

(GUILTY) (NOT GUILTY) (NOLO CONTENDERE)

This 14th day of March, 2018

[Signature]
Defendant

Attorney for Defendant

JEFFREY LANGLEY
DISTRICT ATTORNEY
ENOTAH JUDICIAL CIRCUIT

By: [Signature]
Assistant District Attorney

The Defendant herein waives formal Arraignment, Indictment
by grand jury and Pleads:

(GUILTY) (NOT GUILTY) (NOLO CONTENDERE)

This _____ day of _____, _____

Defendant

Attorney for Defendant

JEFFREY LANGLEY
DISTRICT ATTORNEY
ENOTAH JUDICIAL CIRCUIT

By: _____
Assistant District Attorney

BILL OF INDICTMENT
STATE OF GEORGIA, COUNTY OF UNION
IN THE SUPERIOR COURT OF SAID COUNTY, THE GRAND JURORS, selected, chosen and
Sworn for the County of Union, to wit:

- | | |
|---|--|
| 1. Angela Dawn S Brookshire, Foreperson | 13. Glayds E. Lunsford |
| 2. Shelem Em Flemons, Asst. Foreperson | 14. Lois Jones Rich, Clerk |
| 3. William Alan Ohara | 15. Adam Kevin Irvin |
| 4. Roy Joseph Crissman | 16. Shelia Dalli Noiles |
| 5. Howard Elvin Brys | 17. Paul Brohns Owenby |
| 6. Everett Harley Davenport | 18. Darlene Hastings Carter |
| 7. Kerry Lynn Hinson | 19. Brenda Cunningham Conley |
| 8. Michael Shane Womack | 20. Richard Dee Corbin, Jr. |
| 9. Ricky Jay Dicks | 21. Brandi Leann Allbritton |
| 10. Eddie Dwayne Waters | 22. Melissa Martin Camp |
| 11. Peggy Virginia Sosebee | 23. Kenneth Eugene Harrison |
| 12. Amanda Maria Harwood | |

COUNT 1

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Terroristic Threats** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 while suggesting the death of Susan Kimberly Spears, with the purpose of terrorizing said person, did threaten to take Susan Kimberly Spears "to the woods" and kill her, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

COUNT 2

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Battery, Family Violence** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 did intentionally cause substantial physical harm and visible bodily harm, that being bleeding to the lip, scratching to the face, and redness about the face, to the person of Susan Kimberly Spears, said person and the accused were at the time of the battery living in the same household, by striking Susan Kimberly Spears about the face and head, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

COUNT 3

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Battery** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 did intentionally cause substantial physical harm and visible bodily harm, that being bleeding to the lip, laceration to the face, and redness about the face and head, to the person of Susan Kimberly Spears by striking Susan Kimberly Spears about the face and head, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

COUNT 4

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Simple Battery, Family Violence** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 did intentionally make physical contact of an insulting or provoking nature and cause physical harm, that being pain to the scalp, to the person of Susan Kimberly Spears, said person and the accused not being siblings but were at the time of the offense living in the same household, by pulling the hair of Susan Kimberly Spears until strands of hair were pulled from the head of Susan Kimberly Spears, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

COUNT 5

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Simple Battery** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 did intentionally make physical contact of an insulting or provoking nature and cause physical harm, that being pain to the scalp, to the person of Susan Kimberly Spears by pulling the hair of Susan Kimberly Spears until strands of hair were pulled from the head of Susan Kimberly Spears, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

COUNT 6

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Simple Assault, Family Violence** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 did commit an act which placed Susan Kimberly Spears in reasonable apprehension of immediately receiving a violent injury by placing his fingers in the mouth of Susan Kimberly Spears while stating that he was going to break her jaw and in the process did break a partial denture, said person and the accused not being siblings but were at the time of the offense living in the same household, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

COUNT 7

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Simple Assault** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 did commit an act which placed Susan Kimberly Spears in reasonable apprehension of immediately receiving a violent injury by placing his fingers in the mouth of Susan Kimberly Spears while stating that he was going to break her jaw and in the process did break a partial denture, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

COUNT 8

The Grand Jurors aforementioned, in the name of and on behalf of the citizens of Georgia, charge and accuse **ANTHONY JAMES SMITH** with the offense of **Hindering Emergency Telephone Call** for that said accused in Union County, Georgia on or about the 3rd day of May, 2017 did physically obstruct, prevent, and hinder Susan Kimberly Spears from making a 9-1-1 telephone call request help with the intent to cause physical harm to Susan Kimberly Spears, contrary to the laws of said State, the good order, peace and dignity thereof.

Jeffrey Langley
District Attorney

Personally came Sgt. Douglas Brackett, who on oath says that, to the best of affiant's knowledge and belief that Anthony James Smith did, in the County aforesaid, commit the offense of, TO WIT 16-5-23.1(f) Battery (Family Violence) on 05/03/17 at 4:25 p.m., in UNION County, Georgia; the place of occurrence of said offense being Hwy 515 East, Blairsville, Ga; and against the laws of the State of Georgia.

Said offense being described as: 16-5-23.1(f) Battery (Family Violence)

For the said Anthony James Smith did violate O.C.G.A. 16-5-23.1(f) when he/she willingly and knowingly intentionally cause substantial visible bodily harm to Susan Kimberly Spears by punching her in the face, which resulted in her lip to be bruised, busted and swollen . Defendant and Susan Kimberly Spears are persons living in the same household.

and thus deponent makes this affidavit that a warrant may issue for his/her arrest.

Sworn to and subscribed before me, this 04th day of May, 2017.

Sgt. Doug Brackett
Affiant

Jessie A. Collins
Judge

FILED IN OFFICE THIS 6 DAY OF
July 2017 AT 3:00P M
Judy L. Coleman
Superior Court Clerk Union County

STATE WARRANT

THE STATE

V.

Anthony James Smith
7577 West Union Road
Young Harris, GA 30582

W M DOB: 12/03/70

CHARGED WITH:

Battery (Family Violence)

O.C.G.A. § 16-5-23.1(f)

PROSECUTOR:

Sgt. Douglas Brackett
378 Beasley St.
Blairsville, Ga

Law Enforcement Case #

17055741

Bond Amt

1000.00
1000.00
10:00 AM
5/24/17

GEORGIA, UNION COUNTY

To any sheriff, deputy sheriff, coroner, constable, marshall or other law enforcement officer of Georgia - Greetings: For sufficient causes made known to me in the above affidavit and from other oral testimony given under oath, you are hereby commanded to arrest Anthony James Smith, the Defendant named in the foregoing affidavit charged by the prosecutor therein with the offense against the laws of the State of this State as enunciated in this affidavit and bring him/her before me or some other Judicial Officer of this State to be dealt with as the law directs. Herein fail not.

So ordered this May 04, 2017

Jessie A. Collins
Judge

RECEIVED

MAY 4 2017

Initial: _____

pleaded on
05-23-17 @ 2144
By Deputy James [unclear]
224

STATE OF GEORGIA
UNION COUNTY
I, Judy L. Odum, Superior Court Clerk
Union County Georgia, do hereby
certify that the within is a true and
correct copy as appears on record
in this office.

GEORGIA, UNION COUNTY

WARRANT NO. 17-9102-B

NO. 17-9102-B
MISDEMEANOR

Personally came Sgt. Douglas Brackett, who on oath says that, to the best of affiant's knowledge and belief that Anthony James Smith did, in the County aforesaid, commit the offense of, TO WIT 16-10-24.3 Obstructing/Hindering Emergency Call on 05/03/17 at 4:25 p.m., in UNION County, Georgia; the place of occurrence of said offense being Hwy 515 East Blairsville, GA; and against the laws of the State of Georgia.

STATE WARRANT

Said offense being described as: 16-10-24.3 Obstructing/Hindering Emergency Call

THE STATE

For the said Anthony James Smith did violate O.C.G.A. 16-10-24.3 when he/she willingly and knowingly physically obstructed, prevented or hindered Susan Kimberly Spear, with intent to cause physical harm or injury to the said Susan Kimberly Spear from making or completing a telephone call to a law enforcement agency to request police protection. The said accused did snatch her cellphone and threw it in the floor board and stomped it.

V.

Anthony James Smith
7577 West Union Road
Young Harris, GA 30582

and thus deponent makes this affidavit that a warrant may issue for his/her arrest.

W M DOB: 12/03/70

Sworn to and subscribed before me, this 04th day of May, 2017.

Sgt. Doug Brackett
Affiant

FILED IN OFFICE THIS 0 DAY OF May 2017 AT 3:00P M
Judy L. O'Am
Superior Court Clerk Union County

CHARGED WITH:

Obstructing/Hindering Emergency Call

O.C.G.A. § 16-10-24.3

Jane R. Coltrin
Judge

PROSECUTOR:

Sgt. Douglas Brackett
378 Beasley St.
Blairsville, Ga

GEORGIA, UNION COUNTY

To any sheriff, deputy sheriff, coroner, constable, marshall or other law enforcement officer of Georgia - Greetings: For sufficient causes made known to me in the above affidavit and from other oral testimony given under oath, you are hereby commanded to arrest Anthony James Smith, the Defendant named in the foregoing affidavit charged by the prosecutor therein with the offense against the laws of the State of this State as enunciated in this affidavit and bring him/her before me or some other Judicial Officer of this State to be dealt with as the law directs. Herein fail not.

STATE OF GEORGIA
UNION COUNTY
I, Judy L. O'Am, Superior Court Clerk, Union County, Georgia, do hereby certify that the within is a true and correct copy as appears on record in this office.
Law Enforcement Case # 1705574
Bond Amt 100000/20000
10:00 AM 5/4/17

So ordered this May 04, 2017

Jane R. Coltrin
Judge

RECEIVED

MAY 4 2017

Initial: _____

*Filed on 05-23-17 @ 2:44
By Deputy Jenny Rhoads
JRH*

IN THE MAGISTRATE COURT OF UNION COUNTY
STATE OF GEORGIA

STATE OF GEORGIA
UNION COUNTY
I, Judy L. Odum, Superior Court Clerk,
Union County Georgia, do hereby
certify that the within is a true and
correct copy as appears on record
in this office.
Judy L. Odum
Superior Court Clerk

STATE OF GEORGIA

VA. Anthony James Smith

WARRANT 17-9102 AHB
CHARGE: _____

16-5-23, HP

BOND ORDER

16-10-24, 3

- (1) Defendant shall appear in Court when required;
- (2) Defendant shall not threaten nor endanger any person or property in the community;
- (3) Defendant shall not commit any crime pending trial;
- (4) Defendant shall not have any contact with any witness nor otherwise obstruct the administration of justice; and shall avoid all contact with the witnesses in the case;
- (5) Defendant shall not possess any firearms nor occupy any residence or vehicle in which firearms are present;
- (6) Defendant shall prior to his release sign and execute a Waiver of Extradition, expressly waiving any rights under Uniform Criminal Extradition Act (O.C.G.A. 17-13-20, et Seq.) to be extradited should he or she be arrested in another jurisdiction for violation of this Bond Order or for failure to appear in this Court; sufficiency of the bond to be approved by the Sheriff.
- (7) Defendant shall reside at the following address pending trial;
- (8) Defendant shall not possess or consume any controlled substance without a prescription nor occupy any residence or vehicle in which controlled substances are present;
- (9) Defendant is not to be in the presence of any child under the age of eighteen (18) years, without other adult supervision.
- (10) Bond shall be returnable to the Superior Court of Union County, Blairsville, Ga.
- (11) Defendant shall waive his rights under the 4th Amendment to the United States Constitution and corresponding sections of the Georgia State Constitution regarding search and seizures of his person and property.
- (12) That as a condition of granting and continuance of said bond the defendant is to Stay away, absolutely, directly or indirectly, by person or telephone from the person, home, job and school of: Susan Kimberly Spear

SO ORDERED THIS 24th day of May, 2017

[Signature]
Judge, Magistrate Court

I acknowledge notice of the above conditions of my bond and realize that upon breach of the conditions my bond may be revoked, and that I do not have a legal right to a second bond after such revocation.

Dated: 05/24/17

X Anthony Smith
Defendant

FILED IN OFFICE THIS 06 DAY OF
July - 2017 AT 3:00 P.M.
Judy L. Odum
Superior Court Clerk Union County

UNION COUNTY SHERIFF OFFICE
State of GEORGIA
Bond Type: Bonding Company

APPEARANCE BOND CONTRACT
SUPERIOR COURT

WITNESSETH

STATE OF GEORGIA
UNION COUNTY
Judy L. Odom, Superior Court Clerk
Union County Georgia, do hereby
certify that the within is a true and
correct copy as appears on record
in this office.

Judy L. Odom
Superior Court Clerk

That we, ANTHONY JAMES SMITH, PRINCIPAL, and BUCKS BONDING, SECURITY, are held and firmly bound unto his Excellency, The Honorable NATHAN DEAL, Governor of the State of GEORGIA, and his successors in office, in the penal sum of \$4000.00 approved by the Sheriff of UNION County, for the true payment of which we bind ourselves, our heirs, executors, and administrators, jointly and severally, firmly by the presents.

The conditions and obligation of the above bond are such that if the above bound principal shall appear in person for a hearing or trial to determine probable cause, arraignment or any other proceeding scheduled by the Courts of the above stated court from day to day and from term to term of said courts in order to answer the offense(s) of BATTERY/SIMPLE BATTERY - FAMILY VIOLENCE, INTERFERENCE WITH A 911 CALL shall not depart without first obtaining leave of the Court, then the above obligation and bond to be null and void, but otherwise to continue to remain in full force and effect.

In the event that the Court of Inquiry shall bind the Accused over for appearance before the above stated Court, and so doing shall reduce the bail under which the Accused is bound over to an amount less than the penal sum set forth above, then the Principal and Securities named herein shall be obligated without necessity for any new bond or amendment hereto to the Governor of the State of GEORGIA, only in the reduced amount.

YOU ARE HEREBY NOTIFIED THAT THE DATE OF TO BE NOTIFIED HAS BEEN FIXED FOR YOUR APPEARANCE ON THE ABOVE CASE IN THE ABOVE INDICATED COURT, OR APPEARANCE NOTICES WILL BE MAILED TO THE DEFENDANT AT THE ADDRESS PROVIDED BELOW. ALL OTHER AND FURTHER NOTICE AND SERVICE OF PROCESS OF ANY KIND IS HEREBY WAIVED.

IF YOUR CASE IS HELD IN THE SUPERIOR COURT, CONTACT THE DISTRICT ATTORNEY'S OFFICE AT 706-439-6027 FOR THE COURT DATE

TOTAL AMOUNT OF BOND \$4000.00

Personally appears the above named security who, upon being sworn, deposes and says that he is security on the subject bond, that he owns in his own right and name, unencumbered by mortgage, lien or judgment, real estate lying within County described as with a NET EQUITY of \$ Dollars, representing the amount of said bond. Security affirms that there are no other claims against said property not disclosed herein. We severally waive our rights to the benefits of Homestead Exemption Laws of this state and the United States and the Constitution of the State of GEORGIA. In the event that this is a cash bond and it is returned, it shall be returned to

Principal's Home Address:

Principal's Home Phone:

Principal's Cell Phone: 000-000-0000

Principal's Mailing Name: ANTHONY JAMES SMITH

Principal's Mailing Address

Principal's Business Phone: 000-000-0000

Security's Address 137 DILLS FARM ROAD BLAIRSVILLE, GA 30512

Security's Home Phone:

SPECIAL INSTRUCTIONS: NONE 7-1235



Sworn to and subscribed before me this 25th day of May, 2017.
Anthony Smith Principle
Bucks Bonding Security

Approved By

If you fail to appear, your bond will be forfeited and a bench warrant will be issued for your re-arrest. It is your responsibility to know your court date and to keep the DA's office informed of any changes in your address.

Anthony Smith
Principal

As the surety of this bond, I have read the surety responsibility sheet that was given to me and I fully understand my responsibility as the surety of this bond

Bucks Bonding
Surety
Kao Wj
Witness

FILED IN OFFICE THIS 6 DAY
July 2017 AT 3:00
Judy L. Odom
Superior Court Clerk Union Co

IN THE MAGISTRATE COURT OF UNION COUNTY
STATE OF GEORGIA

This is a first appearance hearing. I will begin by reading the warrants containing the charges so that you know what crime you are supposed to have committed. Then I will give you information about what appearance and committal hearings are. I will then ask you some questions about whether you want lawyers and about whether you want a committal hearing, so you need to listen carefully.

- I. Defendant's true name: Anthony James Smith
Defendant's age: 46
Warrant Numbers: 17-9102-AB
Defendant's Education: High School
Defendant's ability to speak, understand, read, and write English: Yes
If the defendant is represent by counsel: No
If charge has been read to defendant: Yes
If defendant want charge read aloud: No
If defendant understands nature of the charge(s): Yes

- II. RIGHTS OF DEFENDANT
Right to representation by counsel
Right to reasonable time to obtain services of counsel before preliminary hearing
Fact that counsel will be provided if determined defendant is financially unable to retain one
Right to counsel during all questioning
Right to remain silent
Fact that any statement made by defendant can be used as evidence at hearings or trial
Right to indictment by Grand Jury for most felonies or to accusation if misdemeanor
Right to speedy trial & trial by jury
Right to confront witnesses
Right to call witnesses on own behalf
Presumption of innocence
Penalty for crime charged (felony-more than a year) (misdemeanor -up to 12 months)
Commitment (Preliminary) hearing is scheduled for _____. If you make bond contact your attorney for legal advice.
Union County Grand Jury meets next _____

- III. Any questions? No
Understand rights? Yes
Wishes and is able to provide own counsel? No
Wants court appointed counsel? NO () YES

[Signature]
Magistrate
X [Signature]
Defendant
[Signature]
Witness

5/24/17
Date
05/24/17
Date
05/24/17
Date
FILED IN OFFICE THIS 00 DAY OF
July 2017 AT 3P M
Judy L. Odom
Superior Court Clerk Union County

IN THE SUPERIOR COURT OF UNION COUNTY
STATE OF GEORGIA

STATE OF GEORGIA
VS
ANTHONY JAMES SMITH
DEFENDANT

)
)
)
)
)

CASE NUMBER:
2017-CR-221-SG

STATE OF GEORGIA
UNION COUNTY
I, Judy L. Odom, Superior Court Clerk,
Union County Georgia, do hereby
certify that the within is a true and
correct copy as appears on record
in this office.

Judy L. Odom
Judy L. Odom, Superior Court Clerk

ARRAIGNMENT DOCUMENTS

COMES NOW, Jeffrey Langley, District Attorney for the Enotah Judicial Circuit, by and through Kelly Holloway, Assistant District Attorney, Prior to arraignment, and herein serves upon the Defendant in the above-styled case, the following documents:

1. One (1) copy of Accusation/Indictment : 2017-CR-221-SG.
2. One (1) copy of Plea Offer. (If available)
3. One (1) copy of States Witness(es) as appears on Accusation/Indictment.
4. One (1) copy of Reciprocal Discovery Order for the Enotah Judicial Circuit.

Service of the aforementioned documents via United States Postal Service with adequate postage affixed thereon to insure delivery to the following:

[Faded recipient address information]

This 20th day of February, 2018.

Jeffrey Langley
District Attorney

[Handwritten signature of Kelly Holloway]

By: Kelly Holloway
Assistant District Attorney
Enotah Judicial Circuit
Georgia Bar Number: 876365

FILED IN OFFICE
2018 FEB 21 AM 9:54
SUPERIOR COURT CLERK
UNION COUNTY, GEORGIA

65 Courthouse Street
Box 6
Blairsville, GA 30512
706-439-6027

IN THE SUPERIOR COURT OF UNION COUNTY
STATE OF GEORGIA

FILED IN OFFICE THIS 14 DAY OF
March 18 AT 9A M

State of Georgia
v.
Anthony James Smith,
Defendant

)
) **Docket 2017-CR-221-SG**
) Judy L. Odum
) Superior Court Clerk Union County
)
)
)

UNION COUNTY
I, Judy L. Odum, Superior Court Clerk,
Union County Georgia, do hereby
certify that the within is a true and
correct copy as appears on record
in this office.

NOTICE OF REPRESENTATION

The Court has informed me of the following:

1. It is my responsibility to obtain the services of an attorney to ~~represent me in this~~ case;
2. If I apply for representation with the Office of the Public Defender and am unable to obtain their services to represent me, and I desire to be represented by an attorney, I am required to obtain my own attorney to represent me;
3. I and my attorney must be prepared to go forward with the trial of my case at the next available trial date;
4. I or my attorney, if I desire to be represented by an attorney, must file any motions regarding this case within 10 days of today's date;
5. My failure to obtain an attorney to represent me will not be grounds for a continuance of my case when it is called for trial;

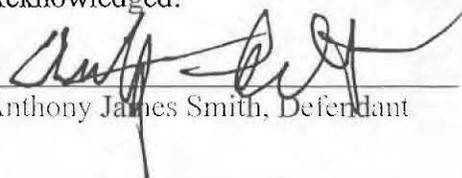
Judy L. Odum
Superior Court Clerk

With regard to obtaining an attorney to represent me: (Initial appropriate response listed below)

- I will apply with the Office of the Public Defender to represent me;
- I will not apply with the Office of the Public Defender to represent me;
- I have obtained the services of an attorney to represent me;
- I will obtain the services of an attorney to represent me;
- I will represent myself.

This 14th day of March, 2018.

Acknowledged:


Anthony James Smith, Defendant

Civil Action No. 02-CV-98HS

Magistrate Court
Superior Court
State Court
Georgia, ~~WINNETT~~ COUNTY
TOWNS

Date Filed 5-10-02

This is to certify that this is a true & correct copy made from the original

Attorney's Address
F.W. GRIFFIN, III

this 7 day of May 2002 ANDREA SMITH

Cecil Dye
Clerk Superior Court

Plaintiff

VS.

Name and Address of Party to be Served

ANTHONY SMITH

Defendant

Garnishee

SHERIFF'S ENTRY OF SERVICE

PERSONAL

I have this day served the defendant Anthony Smith personally with a copy of the within action and summons.

NOTORIOUS

I have this day served the defendant _____ by leaving a copy of the action and summons at his most notorious place of abode in this County.
 Delivered same into hands of _____ described as follows age, about _____ years; weight, about _____ pounds; height, about _____ feet and _____ inches, domiciled at the residence of defendant.

CORPORATION

Served the defendant _____ a corporation by leaving a copy of the within action and summons with _____ in charge of the office and place of doing business of said Corporation in this County.

TACK & MAIL

I have this day served the above styled affidavit and summons on the defendant(s) by posting a copy of the same to the door of the premises designated in said affidavit, and on the same day of such posting by depositing a true copy of same in the United States Mail, First Class in an envelope properly addressed to the defendant(s) at the address shown in said summons, with adequate postage affixed thereon containing notice to the defendant(s) to answer said summons at the place stated in the summons.

NONEST

Diligent search made and defendant _____ not to be found in the jurisdiction of this Court.

This 21ST day of May 2002

Ed Kanner 116 TCSO
DEPUTY

SHERIFF DOCKET 3 PAGE 376

WINNETT COUNTY, GEORGIA

WHITE: Clerk CANARY: Plaintiff Attorney PINK: Defendant

IN THE SUPERIOR / STATE COURT OF TOWNS COUNTY
STATE OF GEORGIA

ANDREA SMITH

PLAINTIFF

CIVIL ACTION
NUMBER 02-CV-98HS

VS.

ANTHONY SMITH

DEFENDANT

SUMMONS

TO THE ABOVE NAMED DEFENDANT:

You are hereby summoned and required to file with the Clerk of said court and serve upon the Plaintiff's attorney, whose name and address is:

F.W. GRIFFIN III

an answer to the complaint which is herewith served upon you, within 30 days after service of this summons upon you, exclusive of the day of service. If you fail to do so, judgment by default will be taken against you for the relief demanded in the complaint.

This 10th day of May, 2002.

Clerk of Superior / State Court

By Janie Walls
Deputy Clerk

Instructions: Attach addendum sheet for additional parties if needed, make notation on this sheet if addendum sheet is used.

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

Towns County, Georgia
Entered
5-10-02
Cecil Dye
Clerk Superior Court

ANDREA M. SMITH,
MOVANT

*
*

v.

Civil Action

File No. 02-CV-98HS

*
*

ANTHONY JAMES SMITH,
RESPAONDENT

*

MOTION FOR CONTEMPT

ANDREA M. SMITH, Plaintiff, files this her Motion for Contempt against ANTHONY JAMES SMITH, Defendant, and shows as follows:

1.

Defendant is subject to the jurisdiction of this Court and may be personally served with a copy of this Motion at .

2.

On February 31, 2000, this Court issued a Final Judgment and Decree in the above-styled case which provided in part as follows:

5.01 Division of Property- "The wife shall convey to husband all of her right, title and interest in and to their 1996 Ford Explorer, 1985 Nissan Pickup, and 1969 Roadrunner. The Husband agrees to pay and be responsible for the indebtedness, if any, for said items and agrees to hold wife harmless from any liability arising therefrom".

5.06 "Both parties agree that they will maintain life insurance on their life and name the parties children as the sole beneficiaries".

7.03 The Husband shall pay the sum of One Hundred Dollars (\$100.00) child support per week directly to the Wife. Said sum is within the support amounts specified under the Uniform Child Support Guidelines in effect in Georgia at the execution of this agreement. Said child support shall continue until the children reach age eighteen (18) years, unless the children are enrolled in a full time college program, in which case said child support shall continue until said child graduates or reaches age twenty-two (22), whichever occurs first.

(7.04) Child Custody and Support - "Husband agrees to maintain and keep medical insurance on the parties minor children at all times."

2.

Notwithstanding such orders, the Defendant has willfully failed and refused to obey the above stated provisions in the following particulars:

(a) Defendant has failed to pay the note on the 1996 Ford Explorer in the amount of \$14,000.00 and has left Plaintiff with the debt to pay.

(b) Defendant has failed to pay the debt in the amount of \$397.59 on the 1969 Roadrunner and has left Plaintiff with the debt to pay.

(c) Defendant has never held medical insurance for the children. They are on Peachcare and Medicare. Plaintiff has made all premiums and has paid all medical expenses incurred.

(d) Defendant has never paid a life insurance premium. Plaintiff has had to pay each and every premium for life insurance policies.

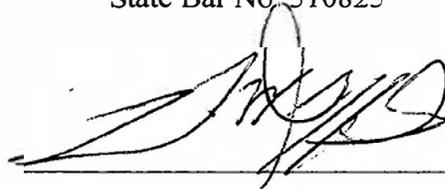
(e) Defendant is presently in arrears \$400 in child support.

6.

It has been necessary for Plaintiff to retain legal counsel and incur substantial costs of litigation in order to enforce this Court's judgment.

WHEREFORE, Plaintiff requests that this Court issue Rule Nisi requiring Defendant to appear and show cause why he should not be held in contempt of court, and required to pay reasonable attorney's fees and expenses of litigation.

F.W. Griffen
Attorney For Movant
State Bar No. 310825



IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

ANDREA M. SMITH,
Petitioner

*
*

v.

Civil Action

File No. 02-CV-9843

*

ANTHONY JAMES SMITH
Respondent

*

VERIFICATION

PERSONALLY APPEARED before me, the undersigned officer, duly authorized by law to administer oaths, **ANDREA M. SMITH**, who, after being duly sworn, states and deposes on oath that she is the Petitioner in the above-styled action and verifies that the facts contained in the within and foregoing motion for contempt are true and correct.

THIS 9 day of May, 2002.

Andrea M. Smith
ANDREA M. SMITH

Sworn to and subscribed before
me this 7th day of
May, 2002.

Kathleen Leonard
NOTARY PUBLIC
My Commission Expires:



IN THE SUPERIOR COURT OF TOWNS COUNTY

STATE OF GEORGIA

ANDREA SMITH

*

CIVIL ACTION FILE NO. 02-CV-98 HS

Plaintiff

*

Versus

*

ANTHONY SMITH

*

Defendant

*

RULE NISI ORDER

The foregoing Petition for Contempt having been read and considered let the same be filed.

Let a copy of said Petition, together with a copy of this Order be served upon the Defendant, Anthony Smith, and let the said Anthony Smith show cause before me at the Courthouse in UNION County, SLAIBSVILLE, Georgia, at 9:30 O'clock A.m on the 30th day of MAY, 2002 why the prayers of said Petition should not be granted.

SO ORDERED, this 10 day of May, 2002.

WITNESSETH, the Honorable Hugh Stone, Judge,
Superior Court, Enotah Judicial Circuit.

Cecil Dye C.S.C.
Judge, Superior Court
Enotah Judicial Circuit

IN THE SUPERIOR COURT OF TOWNS COUNTY

STATE OF GEORGIA

ANDREA M. SMITH	*	CIVIL ACTION FILE NO.
Movant	*	02-CV-98 HS
Versus	*	
ANTHONY JAMES SMITH	*	
Respondent	*	

Towns County, Georgia
Entered
5-30-02
Cecil Dye
Clerk Superior Court

CONSENT ORDER ON MOVANT'S MOTION FOR CONTEMPT

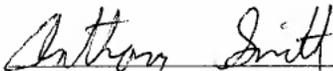
The Movant having filed a Motion for Contempt in the above-styled action and the parties being desirous of a resolve of the pending issues without the necessity of a hearing, it is hereby agreed and stipulated, the following:

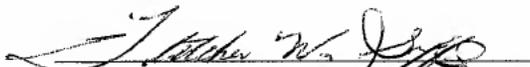
- (1) That the Respondent admits to having failed to abide by the Final Judgment and Decree rendered in the parties' divorce case, namely Smith v. Smith, Superior Court of Union County, State of Georgia, Civil Action File No. 00-CV-33 DB, by:
 - (a) failing to pay the indebtednesses on the 1996 Ford Explorer and the 1969 Roadrunner awarded to him under said Final Judgment and Decree in Section 5.01 of the Settlement Agreement incorporated and adopted as part of same.
 - (b) Failing to maintain life insurance and timely pay premiums on his life and name the parties' children as the sole beneficiaries as required by Section 5.06 of the Settlement Agreement aforementioned.
 - (c) Failing to pay \$100.00 child support weekly as required by Section 7.03 of the Settlement Agreement aforementioned.
 - (d) Failing to maintain and keep medical insurance on the parties' minor children as required by Section 7.04 of the Settlement Agreement aforementioned.
- (2) That the Respondent is in willful contempt of the Court's Final Judgment and Decree.
- (3) That the Respondent will be allowed to purge himself from this contempt by doing the following:
 - (a) Placing the 1996 Explorer on the market instant and asking no less than \$9,000. Movant shall retain possession of the Explorer and market it for sale. She has refinanced the Explorer for \$14,000.00 to avoid its repossession and credit damage and she will be paid within 120 days the difference of the sale price and the cost of refinancing and payments after sale within 120 days of its sale.

- (b) Respondent will pay off the Judgment to Lendmark within 60 days of this Order.
- (c) He will bring all child support current within 30 days of this Order.
- (d) He will reimburse Movant all Peachcare premiums she has paid to maintain insurance on the minor children as well immediately obtain coverage on the minor children through his new employer and timely pay all premiums.
- (e) He will reimburse the Movant all life insurance premiums she has paid on his behalf and pay all future premiums in a timely manner.
- (f) He will reimburse Movant the sum of \$292.00 in attorney fees and filing costs of this action in 90 days of this Order.

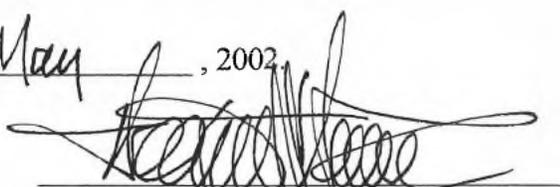
In the event, the Respondent defaults in any of the above purge requirements as outlined in 3 (a-f), Movant may apply ex-parte for an order of incarceration of the Respondent without further notice to the Respondent.

Consented to and agreed:


Respondent


Movant's Attorney on behalf of Andrea Smith

So Ordered this 30th day of May, 2002.


Honorable Hugh Stone
Judge, Superior Court of Towns County
Enotah Judicial Circuit

Civil Action No. 03-CV-246HS
Date Filed 10-29-03

Superior Court
State Court
Magistrate Court
Probate Court
Juvenile Court

This is to certify that the Georgia, Towns COUNTY

Attorney's Address

is a true & correct copy made from the original
this 7 day of May Andrea Smith
2018 Plaintiff

3034 Leavel Dr
Clerk Superior Court

vs.

Anthony Smith

Name and Address of Party to be Served

Anthony Smith Defendant

SHERIFFS' ENTRY OF SERVICE

Garnishee

I have this day served the Garnishee _____ by leaving a copy of the within action and summons with _____

I have this day served the defendant Anthony Smith personally with a copy of the within action and summons, Rule Nisi, Notice of Bad Check and Motion for Contempt

I have this day served the defendant _____ by leaving a copy of the action and summons at his most notorious place of abode in this County.

Delivered same into hands of _____ described as follows: age, about _____ years, weight, about _____ pounds, height, about _____ feet and _____ inches, domiciled at the residence of defendant.

Served the defendant _____ a corporation by leaving a copy of the within action and summons with _____ in charge of the office and place of doing business of said Corporation in this County.

I have this day served the above styled affidavit and summons on the defendant(s) by posting a copy of the same to the door of the premises designated in said affidavit, and on the same day of such posting by depositing a true copy of same in the United States Mail, First Class in an envelope properly addressed to the defendant(s) at the address shown in said summons, with adequate postage affixed thereon containing notice to the defendant(s) to answer said summons at the place stated in the summons. Rule Nisi and Notice of Bad Check, Motion for Contempt

Diligent search made and defendant _____ not to be found in the jurisdiction of this Court.

This 29 day of Oct, 2003

Stanley Richardson
DEPUTY

SHERIFF DOCKET 4 PAGE 158

WHITE Clerk CANARY Plaintiff Attorney PINK Defendant or Garnishee

Towns COUNTY, GEORGIA

Civil Action No. 03 CV 246 HS

Date Filed 11/3/03

Superior Court Probate Court
State Court Juvenile Court
Magistrate Court

Georgia, TOWNS COUNTY

Andrea Smith

Plaintiff

VS.

Anthony Smith

Defendant

GARNISHEE

SHERIFFS' ENTRY OF SERVICE

Garnishee

PERSONAL

I have this day served the Garnishee _____ by leaving a copy of the within action and summons with _____

NOTORIOUS

I have this day served the defendant Anthony Smith personally with a copy of the within action and summons.

I have this day served the defendant _____ by leaving a copy of the action and summons at his most notorious place of abode in this County.

ORAL

Delivered same into hands of _____ described as follows: age, about ____ years, weight, about ____ pounds, height, about ____ feet and ____ inches, domiciled at the residence of defendant.

Served the defendant _____ a corporation by leaving a copy of the within action and summons with _____ in charge of the office and place of doing business of said Corporation in this County.

PACK & MAIL

I have this day served the above styled affidavit and summons on the defendant(s) by posting a copy of the same to the door of the premises designated in said affidavit, and on the same day of such posting by depositing a true copy of same in the United States Mail, First Class in an envelope properly addressed to the defendant(s) at the address shown in said summons, with adequate postage affixed thereon containing notice to the defendant(s) to answer said summons at the place stated in the summons.

NON EST

Diligent search made and defendant _____ not to be found in the jurisdiction of this Court.

This 7 day of November 2003

Cabin Young
DEPUTY

SHERIFF DOCKET 4 PAGE 160

WHITE Clerk CANARY Plaintiff Attorney PINK Defendant or Garnishee

TOWNS COUNTY, GEORGIA

IN THE SUPERIOR COUNTY OF TOWNS COUNTY
STATE OF GEORGIA

Towns County, Georgia
Entered
10-29-03
Cecil Oye
Clerk Superior Court

ANDREA SMITH

Plaintiff

V

ANTHONY SMITH

Defendant

*
*
*
*
*
*
*
*
*

CIVIL ACTION FILE NO. 03-CV-246HS

RULE NISI

Having read the foregoing Complaint, and after consideration thereof, it is:

ORDERED that the Plaintiff in the above styled case show cause before me at the Towns County Courthouse, Towns County, Georgia, on the 17 th day of November, 2003, at 9:30 a.m., why the requests asked for in Plaintiff's Motion for Contempt not be granted.

SO ORDERED, this 29 day of October, 2003.

Cecil Oye
Clerk of Superior Court

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

Towns County, Georgia
Entered
10-29-03
Debi Dye
Clerk Superior Court

ANDREA SMITH

*
*
*
*
*
*
*
*

Plaintiff,

vs.

CIVIL ACTION FILE

ANTHONY SMITH

NO. 03-CV-246HS

Defendant.

MOTION FOR CONTEMPT

COMES NOW, Andrea M. Smith, Plaintiff herein through counsel, and files this Motion for contempt and shows the Court as follows:

1.

Defendant is subject to the jurisdiction of this Court and may be personally served at his residence located at .

2.

The parties were formerly Wife and Husband and were divorced by virtue of a Final Judgment and Decree dated March 31, 2000 in Civil Action File No. 00-CV-33DB Superior Court of Towns County, Georgia, which incorporated an Agreement between the parties as part of said Order. A copy of said decree is attached hereto as Exhibit "A" and incorporated herein by reference.

3.

This Order provided that the Defendant pay child support as set forth in sub paragraph 7.03 of said Order. At the current time, Defendant is in arrears in the total amount of Six Hundred (\$600.00) Dollars.

4.

This Order provided that the Defendant will maintain a life insurance policy as set forth in sub paragraph 5.06 of said Order. At the current time, Defendant is indebted to Plaintiff the amount of \$1,032.00 for premiums on Defendant's life insurance which Plaintiff has incurred and paid since the date of the Final Order.

5.

This Order provided that the Defendant will maintain medical insurance on the parties minor children as set forth in sub paragraph 7.04 of said order. At the current time, Defendant is indebted to Plaintiff in the amount of Three Hundred Seventy Five (\$375.00) for premium payments Plaintiff has paid in order to maintain Defendant's medical insurance on the parties minor children.

6.

Furthermore, a Consent Order (on Movant's Motion for Contempt) dated May 30, 2002 was filed for record on May 30, 2002 in Civil Action File No. 02-CV-98HS in the Superior Court of Towns County, Georgia, a copy of said Consent Order is attached hereto as Exhibit "B" and incorporated herein by reference. Again, Defendant has failed to comply with said Order's provision (3) (f) and to date has failed to pay said sum of \$292.00 in fees and costs.

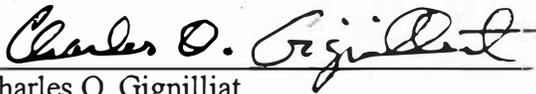
7.

It has been necessary for the Plaintiff to employ an attorney for representation in this matter, and the Defendant should be required to pay reasonable attorney's fees, court costs, and expenses of litigation for the Plaintiff's representation in this proceeding.

WHEREFORE PLAINTIFF PRAYS THAT:

- A) Process be issued and a copy of this Contempt be served upon the Defendant and Defendant be required to appear before this Court as required by law;
- B) Defendant be found in willful contempt of this Court for failing to comply with the various Orders of this Court;
- C) Plaintiff be awarded reasonable attorney's fees and expenses of litigation for this proceeding.
- D) Plaintiff have such other and further relief as the Court deems just and proper.

Respectfully submitted this the 28 day of October, 2003.


Charles O. Gignilliat
Attorney for Plaintiff

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

Towns County, Georgia
Entered
10-29-03
Cecil Dye
Clerk Superior Court

ANDREA SMITH

Plaintiff,

vs.

ANTHONY SMITH

Defendant.

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CIVIL ACTION FILE

NO. 03-00-246HS

VERIFICATION

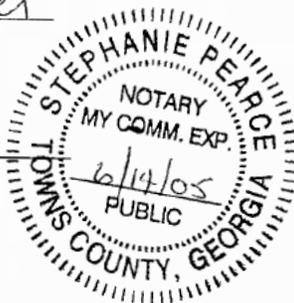
PERSONALLY APPEARED before me, the undersigned officer, duly authorized by law to administer oaths, **Andrea Smith**, who, after being duly sworn, states and deposes on oath that she is the Petitioner in the above-styled action and verifies that the facts contained in the within and foregoing MOTION FOR CONTEMPT are true and correct.

THIS 28th day of October, 2003.

Andrea Smith
Andrea Smith

Sworn to and subscribed before me this 28th day of October, 2003.

Stephanie Pearce
NOTARY PUBLIC
My Commission Expires:



IN THE SUPERIOR COURT FOR THE COUNTY OF TOWNS
STATE OF GEORGIA

COPY

ANDREA SMITH ,

Plaintiff,

v.

ANTHONY SMITH ,

Defendant.

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CIVIL ACTION

FILE NO. 00-CV-33-DB

FINAL JUDGEMENT AND DECREE

Upon consideration of this case, upon evidence submitted as provided by law, it is the judgment of the Court that a total divorce be granted, that is to say, a divorce a vinculo matrimonii, between the parties to the above stated case upon legal principles.

It is considered, ordered, and decreed by the Court that the marriage contract heretofore entered into between the parties to this case, from and after this date, be and is set aside and dissolved as fully and effectually as if no such contract had ever been made or entered into.

Plaintiff and Defendant in the future shall be held and considered as separate and distinct persons altogether unconnected by any nuptial union or civil contract whatsoever and both shall have the right to remarry.

The Agreement between the parties dated March 4, 2000, and the Modification to Settlement Agreement dated March 27, 2000, are approved in their entirety and incorporated into this Final Judgment and Decree as if fully set forth herein.

In determining child support, and as specified in the Settlement Agreement, the Court finds as follows:

The gross annual income of the Father is approximately Twenty-one thousand dollars (\$21,000);

In this case support is being determined for two (2) children

The applicable percentage of gross income to be considered is

<u>No. of children.</u>	<u>Percentage Range of Gross Income.</u>
1	17 percent to 23 percent
X 2	23 percent to 28 percent
3	25 percent to 32 percent
4	29 percent to 35 percent
5	31 percent to 37 percent

The Husband has agreed under the terms of the Settlement Agreement to pay the sum of One Hundred Dollars (\$100.00) per week as child support.

The Court has considered the existence of special circumstances and has found the following special circumstances marked with as "X" to be present in this case:

- _____ 1. Ages of the children
- _____ 2. A child's extraordinary medical costs or needs in addition to accident and sickness insurance, provided that all such cost or needs shall be considered if no insurance is available
- _____ 3. Educational costs
- _____ 4. Day-care costs
- _____ 5. Shared physical custody arrangements, including extended visitation

- _____ 6. A party's other support obligations to another household
- _____ 7. Income that should be imputed to a party because of suppression of income
- _____ 8. In-kind income for the self-employed, such as reimbursed meals or a company car
- _____ 9. Other support a party is providing or will be providing, such as payment of a mortgage
- _____ 10. A party's own extraordinary needs, such as medical expenses
- _____ 11. Extreme circumstances including but not limited to:
 - (A) Unusually high debt structure; or
 - (B) Unusually high income of either party or both parties, which shall be construed as individual gross income of over \$75,000.00 per annum
- _____ 12. Historical spending in the family for children which varies significantly from the percentage table
- _____ 13. Considerations of the economic cost-of-living factors of the community of each party, as determined by the trier of fact
- _____ 14. In-kind contribution of either parent
- _____ 15. The income of the custodial parent
- _____ 16. The cost of accident and sickness dependent children included in the order
- _____ 17. Extraordinary travel expenses to shared physical custody
- _____ 18. Any other factor which the trier of fact deems to be required by the ends of justice, as described below:

In accordance with the provisions of O.C.G.A. Section 19-6-29 and O.C.G.A.

Section 19-6-21(a.1) et seq., shall be used to enforce the current child support, and child support arrearage now or hereafter existing. An Income Deduction Order has been executed in conjunction with this Decree, and its terms shall be and are hereby incorporated by reference herein, and made a part of this Final Judgment and Decree to Divorce.

Plaintiff and Defendant are ordered to comply with each and every term and provision of said Agreement and this Final Judgment and Decree.

The Court finds that both Husband and Wife have completed the Children Cope with Divorce Seminar as required by this Court under Standing Order.

Decree and order entered this 31 day of March, 2000.



David Barrett, Judge
Superior Court
Enotah Judicial Circuit

PREPARED BY:

BRUCE L. FERGUSON
236 South Main Street
P. O. Box 524
Hiawassee, Georgia 30546
Telephone: (706) 896-9699
Facsimile: (706) 896-9401

IN THE SUPERIOR COURT OF TOWNS COUNTY

STATE OF GEORGIA

ANDREA M. SMITH

*

CIVIL ACTION FILE NO.

Movant

*

02-CV-98 HS

Versus

*

ANTHONY JAMES SMITH

*

Respondent

*

Towns County, Georgia
Entered
5-30-02
Cecil Dye
Clerk Superior Court

CONSENT ORDER ON MOVANT'S MOTION FOR CONTEMPT

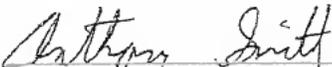
The Movant having filed a Motion for Contempt in the above-styled action and the parties being desirous of a resolve of the pending issues without the necessity of a hearing, it is hereby agreed and stipulated, the following:

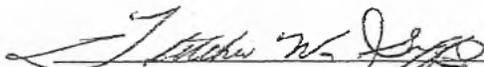
- (1) That the Respondent admits to having failed to abide by the Final Judgment and Decree rendered in the parties' divorce case, namely Smith v. Smith, Superior Court of Union County, State of Georgia, Civil Action File No. 00-CV-33 DB, by:
 - (a) failing to pay the indebtednesses on the 1996 Ford Explorer and the 1969 Roadrunner awarded to him under said Final Judgment and Decree in Section 5.01 of the Settlement Agreement incorporated and adopted as part of same.
 - (b) Failing to maintain life insurance and timely pay premiums on his life and name the parties' children as the sole beneficiaries as required by Section 5.06 of the Settlement Agreement aforementioned.
 - (c) Failing to pay \$100.00 child support weekly as required by Section 7.03 of the Settlement Agreement aforementioned.
 - (d) Failing to maintain and keep medical insurance on the parties' minor children as required by Section 7.04 of the Settlement Agreement aforementioned.
- (2) That the Respondent is in willful contempt of the Court's Final Judgment and Decree.
- (3) That the Respondent will be allowed to purge himself from this contempt by doing the following:
 - (a) Placing the 1996 Explorer on the market instanter and asking no less than \$9,000. Movant shall retain possession of the Explorer and market it for sale. She has refinanced the Explorer for \$14,000.00 to avoid its repossession and credit damage and she will be paid within 120 days the difference of the sale price and the cost of refinancing and payments after sale within 120 days of its sale.

- (b) Respondent will pay off the Judgment to Lendmark within 60 days of this Order.
- (c) He will bring all child support current within 30 days of this Order.
- (d) He will reimburse Movant all Peachcare premiums she has paid to maintain insurance on the minor children as well immediately obtain coverage on the minor children through his new employer and timely pay all premiums.
- (e) He will reimburse the Movant all life insurance premiums she has paid on his behalf and pay all future premiums in a timely manner.
- (f) He will reimburse Movant the sum of \$292.00 in attorney fees and filing costs of this action in 90 days of this Order

In the event, the Respondent defaults in any of the above purge requirements as outlined in 3 (a-f), Movant may apply ex-parte for an order of incarceration of the Respondent without further notice to the Respondent.

Consented to and agreed:


Respondent


Movant's Attorney on behalf of Andrea Smith

So Ordered this 30th day of May, 2002


Honorable Hugh Stone
Judge, Superior Court of Towns County
Enotah Judicial Circuit

Towns County, Georgia
Entered
10-29-03
Cecil Dye
Clerk Superior Court

DATE: OCTOBER 28, 2003

CERTIFIED RECEIPT NO.
SHERIFF'S SERVICE

NOTICE OF BAD CHECK

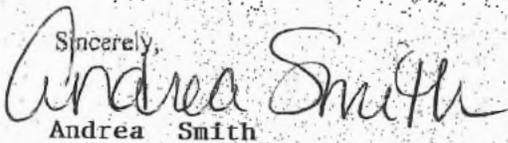
You are hereby notified that the following check(s) or instruments

CHECK NO.	CHECK DATE	CHECK AMOUNT	NAME OF BANK
308	10/03/03	\$200.00	UNITED COMMUNITY BANK

drawn upon UNITED COMMUNITY BANK and payable to ANDREA SMITH
(has) (have) been dishonored. Pursuant to Georgia law, you have ten (10) days from receipt of this notice to tender payment of the total amount of the check(s) or instrument(s) plus the applicable service charge(s) of \$ 25.00, the total amount due being \$225.00 dollars and zero cents.

Unless this amount is paid in full within the specified time above, a presumption in law arises that you delivered the item(s) with the intent to defraud and the dishonored check(s) or instrument(s) and all other available information relating to this incident may be submitted to the magistrate for the issuance of a criminal warrant or citation or to the district attorney or solicitor for the criminal prosecution."

Sincerely,


Andrea Smith

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

TOWNS COUNTY, GEORGIA
CLERK OF SUPERIOR COURT
3-11-03
FILED BY
JANE P. [unclear]

ANDREA SMITH

Plaintiff,

vs.

ANTHONY SMITH

Defendant.

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CIVIL ACTION FILE

NO. 03-CV-246HS

**NOTICE TO PRODUCE AND
REQUEST FOR PRODUCTION OF DOCUMENTS**

TO: Defendant, Anthony Smith

You are hereby notified to produce at any hearing and/or trial in the above case, and from time to time and term to terms until the above case is concluded, the documents and records set forth below which are in your possession, custody or control, the same to be used as evidence by the Plaintiff above.

In addition, you are requested to produce, pursuant to O.C.G.A. Section 9-11-34, the documents and records set forth below for inspection and copying by the attorneys for Plaintiff at the office of Charles O. Gignilliat, where adequate facilities are available for copying, at such time as is agreed by counsel, but in any event, within the time required by law.

1.

All pay stubs, statements of earnings, and any other documents given to you by your employer and/or any other person, partnership, corporation, or other entity showing your income from any source from January 1, 2003 to the date of trial in the above-styled case, including but not limited to unemployment earnings for this period of time.

2.

All records of bank checking accounts, savings accounts, cash management accounts, certificates of deposit, investment and money market accounts maintained by you, individually and/or jointly with others, or maintained by you as trustee or custodian for any other person or persons, including but not limited to monthly bank statements, canceled checks, deposit slips, check registers, passbooks, statements relating to savings accounts, certificates of deposit, and any other such records from January 1, 2003 to the date of trial of the above-styled case.

3.

Any and all documents, receipts, or vouchers reflecting the funds provided to you, directly or indirectly, for reimbursement or otherwise by your employer as an expense account or reimbursed expenses for the period from January 1, 2003 to the present.

4.

Any and all employment contracts between you and your present employer and previous employers, from January 1, 2003 to the present.

This 3rd day of November, 2003.

Respectfully Submitted,



Charles O. Gignilliat
Attorney for Plaintiff
Ga. Bar No. 293250

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

11-26-03

Andrea Smith
Plaintiff

)

)

)

vs

)

)

Anthony Smith
Defendant

)

)

CIVIL ACTION FILE

NO. 03 CV 246 HS

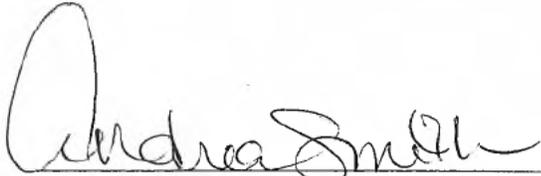
CONSENT ORDER ON MOTION FOR CONTEMPT

The Plaintiff, having filed a Motion For Contempt in the above styled action, states the parties are now desirous to resolve the pending issues without the necessity of a hearing, the parties have therefore agreed and stipulated as follows:

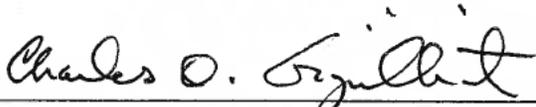
- (1) That the defendant has paid \$600.00 on the arrearage in child support and is paid up in child support through Friday, November 28, 2003. The Plaintiff shall therefore drop and or dismiss the bad check charge against the Defendant on check #308 dated October 3, 2003 payable to Andrea Smith and drawn on United Community Bank.
- (2) The Defendant has paid another \$750.00 on past due life insurance premiums, past due medical insurance premiums, and an outstanding attorney's fee of \$292.00 from a previous contempt. Plaintiff acknowledges all past due amounts for life insurance premiums, medical insurance premiums, and outstanding attorney's fees have been paid in full. Defendant shall from henceforth pay \$24.00 per month to Plaintiff as premium for life insurance coverage on the Defendant for the parties two (2) children. Defendant shall from henceforth pay \$15.00 per month to Plaintiff as premium for medical insurance coverage for the parties two (2) children.
- (3) The plaintiff has incurred costs in the bringing of this civil action in the amount of \$120.00 and Defendant shall reimburse Plaintiff for one-half (1/2) of said costs, or \$60.00, within thirty (30) days of the filed recorded date of this Consent Order.

Respectfully prepared by Attorney for Plaintiff this 14th day of November, 2003.

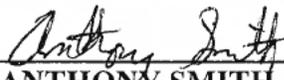
Consented to and agreed:



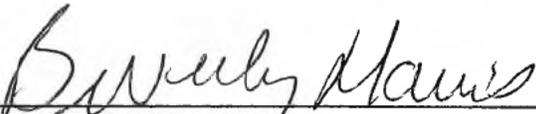
ANDREA SMITH, Plaintiff



CHARLES O. GIGNILLIAT,
Attorney for Plaintiff



ANTHONY SMITH, Defendant



BEVERLY HARRIS,
Attorney for Defendant

So ordered this 25th day of November, 2003.



HONORABLE HUGH STONE
Judge, Superior Court of Towns County
Enotah Judicial Circuit

MUNICIPAL COURT ALLEN COUNTY, OHIO
 STATE OF OHIO LIMA CITY VILLAGE TOWNSHIP
 TICKET # B278983
 CASE # 13TRC10733

NAME ANTHONY JAMES SMITH

STREET _____

CITY, STATE _____ ZIP _____

OPERATOR LICENSE/STATE ID# <input type="checkbox"/> None		BIRTH DATE	ISSUE DATE	STATE
CLASS	EXPIRES	ENDORSEMENT(S)/RESTRICTION(S)		SS# (last 4 digits)
<input type="checkbox"/> CDL <input type="checkbox"/> MC <input type="checkbox"/> Other				
SEX	HEIGHT	WEIGHT	EYES	HAIR
<u>M</u>	<u>5-11</u>	<u>160</u>	<u>HAZ</u>	<u>BRN W</u>
FINANCIAL RESPONSIBILITY PROOF?				
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A				

If no DL/State ID, REQUIRED documentation attached: YES NO OTHER

TO DEFENDANT: COMPLAINT ON 10/15, 2013 AT 2340 A.M. YOU
 Operate/Passenger/Parked/Walked a Passenger Motorcycle Bicycle Other
 Commercial DOT# ≥26,001 lbs. <16 Pass. Bus ≥16 Pass. Bus Haz. Mat.
 VEHICLE: YEAR 2002 MAKE FORD MODEL MUSTANG
 COLOR BLACK LICENSE # AOV1395 STATE GA
 UPON A PUBLIC HIGHWAY, NAMEDLY SR-81
 AT/NEAR NEUBRECHT RD (M.P. _____)
 IN THE TWP OF BATH IN ALLEN
 COUNTY (NO.), 02 STATE OF OHIO AND COMMITTED THE FOLLOWING OFFENSE(S).

SPEED: _____ MPH in _____ MPH zone		<input type="checkbox"/> ORC <input type="checkbox"/> ORD <input type="checkbox"/> T.P.
<input type="checkbox"/> Over limits <input type="checkbox"/> Unsafe for conditions <input type="checkbox"/> ACDA <input type="checkbox"/> Radar <input type="checkbox"/> Air <input type="checkbox"/> VASCAR <input type="checkbox"/> Pace <input type="checkbox"/> Laser <input type="checkbox"/> Stationary <input type="checkbox"/> Moving		
<input checked="" type="checkbox"/> OVI: <input checked="" type="checkbox"/> Under the influence of alcohol/drug of abuse.		<input type="checkbox"/> ORC <input type="checkbox"/> ORD <input type="checkbox"/> T.P.
<input checked="" type="checkbox"/> Prohibited blood alcohol concentration. <u>0.274</u> BAC		<u>4511.1A16</u>
<input type="checkbox"/> Blood <u>Sp</u> Breath <input type="checkbox"/> Urine <input type="checkbox"/> Ref used		<u>4511.1A16</u>
Prior OVIs:	# of prior OVIs <u>2</u>	Years of prior OVIs <u>9600</u>
DRIVER LICENSE: <input type="checkbox"/> None <input type="checkbox"/> Not on person <input type="checkbox"/> Revoked <input type="checkbox"/> Suspended		<input type="checkbox"/> ORC <input type="checkbox"/> ORD <input type="checkbox"/> T.P.
EXPIRED: <input type="checkbox"/> <6 months <input type="checkbox"/> >6 months <input type="checkbox"/> Failure to Reinstatement		
SAFETY BELT: Failure to wear		<input type="checkbox"/> ORC <input type="checkbox"/> ORD <input type="checkbox"/> T.P.
<input type="checkbox"/> Driver <input type="checkbox"/> Passenger <input type="checkbox"/> Child Restraint <input type="checkbox"/> Booster Seat		
<input checked="" type="checkbox"/> OTHER OFFENSE: <u>MARKED LANES</u>		<input type="checkbox"/> ORC <input type="checkbox"/> ORD <input type="checkbox"/> T.P.
		<u>4511-33A</u>
OTHER OFFENSE:		<input type="checkbox"/> ORC <input type="checkbox"/> ORD <input type="checkbox"/> T.P.
<input type="checkbox"/> DRIVER LICENSE HELD <input type="checkbox"/> VEHICLE SEIZED <input type="checkbox"/> JUVENILE OFFENDER		
PAVEMENT: <input type="checkbox"/> Dry <input checked="" type="checkbox"/> Wet <input type="checkbox"/> Snow <input type="checkbox"/> Icy # of Lanes <u>2</u> <input type="checkbox"/> Construction Zone		
VISIBILITY: <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy <input type="checkbox"/> Dusk <input type="checkbox"/> Night <input type="checkbox"/> Dark		
WEATHER: <input checked="" type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Fog <input type="checkbox"/> No Adverse <u>BLUET</u>		
TRAFFIC: <input type="checkbox"/> Heavy <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Light <u>BLUET</u>		
AREA: <input checked="" type="checkbox"/> Business <input type="checkbox"/> Rural <input type="checkbox"/> Residential <input type="checkbox"/> Industry <input type="checkbox"/> School		
CRASH: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Almost Caused <input type="checkbox"/> Non-Injury <input type="checkbox"/> Injury <input type="checkbox"/> Fatal		
Crash Report Number: <u>02-0598</u>		
REMARKS: <u>1ST OFF.</u>		
ACCOMPANYING CRIMINAL CHARGE <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No TOTAL OFFENSES <u>3</u>		

TO DEFENDANT: SUMMONS PERSONAL APPEARANCE REQUIRED Yes No
 You are summoned and ordered to appear on 10/15, 2013 at 1000 P.M.,
 in MUNICIPAL Court, at 605 W UNION ST
 If you fail to appear at this time and place you may be arrested or your license may be cancelled.
 This summons served personally on the defendant on 10/16, 2013
 The Issuing/charging law enforcement officer states under the penalties of perjury and falsification that he/she has read the above complaint and that it is true

JPR Dutton
 Issuing Law Enforcement Officer

0220	4511	2	1
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Issuing Law Enforcement Officer: SAME AS ABOVE
 Issuing Officer: Verify address. If different from license address, write present address in space provided.

PRESENT ADDRESS SAME SIGNATURE X DO. RES. TOWNS P NE (760,460) 33

IN THE LIMA MUNICIPAL COURT, LIMA, ALLEN COUNTY, OHIO

STATE OF OHIO)
 PLAINTIFF)
 -VS-)
ANTHONY J SMITH)
 DEFENDANT)

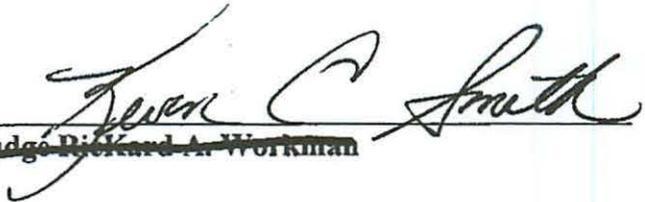
CASE NO. 13TRC10733


DISMISSAL WITHOUT
PREJUDICE

This matter came on to be heard this 04-30-2015 following expiration of a WARRANT originally issued on OCTOBER 21, 2014. The Defendant having never been served with the WARRANT and his/her whereabouts being unknown or outside of this jurisdiction, the matter should be dismissed without prejudice at STATE cost, pursuant to Superintendence Rule

Therefore it is ORDERED that the matter be dismissed without prejudice with costs to the STATE.

SO ORDERED.


~~Judge Richard A. Workman~~

KEVIN C. SMITH
VISITING JUDGE



LIMA MUNICIPAL COURT TRAFFIC/CRIMINAL DOCKET (419)221-5275 FX (419)998-5526

13TRC10733-A 1-4511.19A1A&A1H OVI

TKT#: B278983

INC#:

OHIO HIGHWAY PATROL FILE DATE : 10/08/2013 FINES:
VS DATE HEARD: 04/30/2015 SUSP :
SMITH, ANTHONY J VIOL DATE : 10/05/2013 COSTS: 0.00
FINDING : DSSA CREDIT:
PLEA : NG TOTAL: 0.00
PLEA DATE : 10/09/2013

██████████-4030

RECEIPT DATE AMOUNT JUDGE : RICKARD A. WORKMAN, JUDGE
BD7436 10/08/2013 1064.00 ATTY : GOTTSCHALK, CRAIG A
OFFICER: TPR A HANKINSON
JAIL :
JAIL TM:
LIC SUS:
JAIL DY:
P-T SUS:
PROBATN:

***** STATUS HISTORY ***** BOND HISTORY *****

BOND POSTED 10/07/2013 AMOUNT : 1064.00 DT REC:10/08/2013
ADMINISTRATIVE LICENS 10/08/2013 REFUND : 0.00 RECT# :BD743679
ARRAIGNMENT 10/09/2013 FORFEIT:00000y6400 REF/FR:
BOND POSTED 10/09/2013 CTY FEE: 0.00 CHECK#:
JE (NOT GUILTY PLEA) 10/09/2013 RECT# :
PLEAD NOT GUILTY 10/10/2013
REQUEST FOR DISCOVERY 10/11/2013
NOTICE OF COUNSEL FIL 10/11/2013
REQ FOR NOT OF INT EV 10/11/2013
JURY DEMAND FILED 10/11/2013
PRE-TRIAL HEARING 11/13/2013
PRE-TRIAL HELD 11/13/2013
JOURNAL ENTRY/PRETRIA 11/13/2013
WAIVER OF TIME FILED 11/13/2013
MOT TO SUPPRESS FILED 12/10/2013
SUBPOENA ISSUED 01/17/2014
SUBPOENA ISSUED 01/17/2014
SUBPOENA RETURNED SER 01/21/2014
SUBPOENA RETURNED SER 01/22/2014
MOTION HEARING 02/03/2014
JOURNAL ENTRY/PRETRIA 02/04/2014
MOT TO SUPPRESS FILED 02/14/2014
SUBPOENA ISSUED 03/17/2014
SUBPOENA RETURNED SER 03/18/2014
MOT FOR CONT FILED 03/19/2014
MOTION HEARING 03/31/2014
JOURNAL ENTRY OF CONT 03/21/2014
SUBPOENA ISSUED 03/31/2014
SUBPOENA ISSUED 03/31/2014
SUBPOENA RETURNED SER 03/31/2014
SUBPOENA RETURNED SER 04/02/2014
MOTION HEARING 04/14/2014
MOTION HEARING HELD 04/14/2014
SUBPOENA ISSUED 04/28/2014

SUBPOENA ISSUED 04/28/2014
SUBPOENA RETURNED SER 04/29/2014
SUBPOENA RETURNED SER 04/30/2014
MOTION HEARING 05/12/2014
MISC. ENTRY FILED 05/27/2014
BRIEFS FILED 05/29/2014
BRIEFS FILED 06/06/2014
JOURNAL ENTRY FILED 07/14/2014
JURY TRIAL 10/23/2014
JURY PRETRIAL 10/15/2014
JOURNAL ENTRY/PRETRIA 10/17/2014
FAILED TO APPEAR 10/15/2014
WARRANT BLOCK 10/21/2014
BOND FORFEITURE 10/22/2014
WARRANT ISSUED JUDGE 10/21/2014
MOTION WITHDRAWAL OF 11/10/2014
JOURNAL ENTRY FILED 11/13/2014
WARRANT BLOCK RELEASE 04/29/2015
WARRANT RETURN JUDGE 04/29/2015
DISM. SUP RULES 04/30/2015
***** DOCKET/JOURNAL *****
04/30/2015 DISM. SUP RULES
DISM. SUP RULES 04-30-2015
04/30/2015 Subcase: B
04-30-2015
FOUND DISM SUP RULES ASSIGNED

Subcase: A
FOUND DISM SUP RULES ASSIGNED
04/29/2015 WARRANT RETURN JUDGE
RETURNED NOT SERVED - EXPPRIED 04-29-2015
04/29/2015 WARRANT BLOCK RELEASE
WARRANT BLOCK RELEASE 04-29-2015
11/13/2014 JOURNAL ENTRY FILED
MWD IS DENIED CC: ATTY/ PROS 11-13-2014
11/10/2014 MOTION WITHDRAWAL OF COUNSEL
KELLEY 11-10-2014
10/22/2014 BOND FORFEITURE
BOND FORFEITURE 10-22-2014
10/21/2014 WARRANT ISSUED JUDGE
A-\$200 CASH B-\$80 CASH 10-21-2014
10/21/2014 WARRANT BLOCK
WARRANT BLOCK 10-21-2014
10/17/2014 FAILED TO APPEAR
A-\$2000 10% B-\$800 10% 10-15-2014
10/17/2014 JOURNAL ENTRY/PRETRIAL FILED
FTA 10-17-2014
08/13/2014 JURY PRETRIAL
JURY PRETRIAL 10-15-2014 01:15PM
08/13/2014 JURY PRETRIAL
Notification of JURY PRETRIAL for 10-15-2014 at 01:15PM has been
emailed. Emails sent to GOTTSCHALK, CRAIG A, LIMA CITY PROSECUTOR, LIMA
CITY PROSECUTOR.
08/13/2014 JURY TRIAL
JURY TRIAL 10-23-2014 09:00AM

08/13/2014 JURY TRIAL
Notification of JURY TRIAL for 10-23-2014 at 09:00AM has been
emailed. Emails sent to GOTTSCHALK, CRAIG A, LIMA CITY PROSECUTOR, LIMA
CITY PROSECUTOR.

07/14/2014 JOURNAL ENTRY FILED
MSU DENIED. COPY TO DEF AND ATT 07-14-2014

06/09/2014 BRIEFS FILED
FINAL ARGUMENT /DEFT 06-06-2014

05/29/2014 BRIEFS FILED
STATES & FINAL ARGUMENT 05-29-2014

05/29/2014 MISC. ENTRY FILED
CLOSING ARGUMENT 05-27-2014

04/30/2014 SUBPOENA RETURNED SERVED
BM MONTGOMERY 04-30-2014

04/29/2014 SUBPOENA RETURNED SERVED
RS JOHNSON 04-29-2014

04/28/2014 SUBPOENA ISSUED
STATE JOHNSON 04-28-2014

04/28/2014 SUBPOENA ISSUED
STATE MONTGOMERY 04-28-2014

04/15/2014 MOTION HEARING
MOTION HEARING 05-12-2014 02:00PM

04/15/2014 MOTION HEARING
Notification of MOTION HEARING for 05-12-2014 at 02:00PM has been
emailed. Emails sent to GOTTSCHALK, CRAIG A, LIMA CITY PROSECUTOR, LIMA
CITY PROSECUTOR.

04/14/2014 MOTION HEARING HELD
MOTION HEARING HELD 04-14-2014

04/02/2014 SUBPOENA RETURNED SERVED
RS GRIGSBY 04-02-2014

03/31/2014 SUBPOENA RETURNED SERVED
BM MONTGOMERY 03-31-2014

03/31/2014 SUBPOENA ISSUED
STATE GRIGSBY 03-31-2014

03/31/2014 SUBPOENA ISSUED
STATE MONTGOMERY 03-31-2014

03/21/2014 MOTION HEARING
MOTION HEARING 04-14-2014 03:00PM

03/21/2014 MOTION HEARING
Notification of MOTION HEARING for 04-14-2014 at 03:00PM has been
emailed. Emails sent to GOTTSCHALK, CRAIG A, LIMA CITY PROSECUTOR, LIMA
CITY PROSECUTOR.

03/21/2014 JOURNAL ENTRY OF CONTINUANCE
JOURNAL ENTRY OF CONTINUANCE 03-21-2014

03/20/2014 MOT FOR CONT FILED
MOT FOR CONT FILED 03-19-2014

03/19/2014 SUBPOENA RETURNED SERVED
BM.MONTGOMERY 03-18-2014

03/17/2014 SUBPOENA ISSUED
STATE.MONTGOMERY 03-17-2014

02/24/2014 MOTION HEARING
MOTION HEARING 03-31-2014 03:00PM

02/24/2014 MOTION HEARING
Notification of MOTION HEARING for 03-31-2014 at 03:00PM has been
emailed. Emails sent to GOTTSCHALK, CRAIG A, LIMA CITY PROSECUTOR, LIMA

CITY PROSECUTOR.
02/14/2014 MOT TO SUPPRESS FILED
AMENDED; REQ HRG 02-14-2014
02/06/2014 JOURNAL ENTRY/PRETRIAL FILED
SET FOR MOT HRG - GRANTED CONT DUE BAD WEATHER 02-04-2014
01/22/2014 SUBPOENA RETURNED SERVED
BM MONTGOMERY 01-22-2014
01/21/2014 SUBPOENA RETURNED SERVED
RG GRIGSBY 01-21-2014
01/17/2014 SUBPOENA ISSUED
STATE MONTGOMERY 01-17-2014
01/17/2014 SUBPOENA ISSUED
STATE GRIGSBY 01-17-2014
01/02/2014 MOTION HEARING
MOTION HEARING 02-03-2014 08:30AM
01/02/2014 MOTION HEARING
Notification of MOTION HEARING for 02-03-2014 at 08:30AM has been
emailed. Emails sent to GOTTSCHALK, CRAIG A, LIMA CITY PROSECUTOR, LIMA
CITY PROSECUTOR.
12/10/2013 MOT TO SUPPRESS FILED
SUPPRESS EVIDENCE/REQUEST HEARING 12-10-2013
11/13/2013 WAIVER OF TIME FILED
WAIVER OF TIME FILED 11-13-2013
11/13/2013 JOURNAL ENTRY/PRETRIAL FILED
MOT HRG SET FOR 11-13-2013
11/13/2013 PRE-TRIAL HELD
PRE-TRIAL HELD 11-13-2013
10/15/2013 PRE-TRIAL HEARING
PRE-TRIAL HEARING 11-13-2013 10:00AM
10/15/2013 PRE-TRIAL HEARING
Notification of PRE-TRIAL HEARING for 11-13-2013 at 10:00AM has been
emailed. Emails sent to GOTTSCHALK, CRAIG A, LIMA CITY PROSECUTOR, LIMA
CITY PROSECUTOR.
10/11/2013 JURY DEMAND FILED
JURY DEMAND FILED 10-11-2013
10/11/2013 REQ FOR NOT OF INT EVID FILED
REQ FOR NOT OF INT EVID FILED 10-11-2013
10/11/2013 NOTICE OF COUNSEL FILED
GOTTSCHALK 10-11-2013
10/11/2013 REQUEST FOR DISCOVERY
REQUEST FOR DISCOVERY 10-11-2013
10/10/2013 PLEAD NOT GUILTY
LOT ASSIGN TO RAW 10-10-2013
10/09/2013 JE (NOT GUILTY PLEA) FILED
10/09/2013 BOND POSTED
800UA B 10-09-2013
10/08/2013 BOND POSTED
\$1,000 + STATE FEE A CASE 10-07-2013
10/08/2013 ADMINISTRATIVE LICENSE SUSP.
NO SIEZ/SAME OWNER 10-08-2013
10/08/2013 ARRAIGNMENT
ARRAIGNMENT 10-09-2013 09:00AM

***** REMARKS *****

10/08/13 The address of does not show to have local mail delivery. Young
Harris is

located in Towns County and their Board of Tax Assessors shows a mailing address of for the address. JL

BOND CONTINUED A CASE B-800 UA

13TRC10733-B 4511.33A MARKED LANES/DRIVING IN TKT#: B278983
INC#:

OHIO HIGHWAY PATROL VS
SMITH, ANTHONY J RD
-4030

FILE DATE : 10/08/2013 FINES:
DATE HEARD: 04/30/2015 SUSP :
VIOL DATE : 10/05/2013 COSTS: 0.00
FINDING : DSSA CREDIT:
PLEA : NG TOTAL: 0.00
PLEA DATE : 10/09/2013

RECEIPT DATE AMOUNT JUDGE : RICKARD A. WORKMAN, JUDGE
ATTY : GOTTSCHALK, CRAIG A
OFFICER: TPR A HANKINSON
JAIL :
JAIL TM:
LIC SUS:
JAIL DY:
P-T SUS:
PROBATN:

Civil Action No. 03-00-13508

Superior Court
State Court
Juvenile Court

Magistrate Court
Probate Court

Date Filed 6-10-03

TOWNS COUNTY

Georgia, _____ COUNTY

Attorney's Address

McDowell & Associates, Ltd.
P.O. Box 350849
Atlanta GA 31145
404-634-1100 / FAX 404-634-0311
024042 / 39049

This is to certify that this First Motor Credit Company
is a true & correct copy
made from the original
Plaintiff

this 7 day of May
20 03 vs.

Name and Address of Party to be Served.

Anthony J. Smith
7021 W. Union Road
ROCKY HARRIS, GA 30782

Cecil Dye
Clerk Superior Court

Defendant

Garnishee

SHERIFF'S ENTRY OF SERVICE

PERSONAL

I have this day served the defendant Anthony J Smith personally with a copy of the within action and summons.

NOTORIOUS

I have this day served the defendant _____ by leaving a copy of the action and summons at his most notorious place of abode in this County.

Delivered same into hands of _____ described as follows: age, about _____ years; weight _____ pounds; height, about _____ feet and _____ inches, domiciled at the residence of defendant.

CORPORATION

Served the defendant _____ a corporation
 by leaving a copy of the within action and summons with _____ in charge of the office and place of doing business of said Corporation in this County.

TACK & MAIL

I have this day served the above styled affidavit and summons on the defendant(s) by posting a copy of the same to the door of the premises designated in said affidavit, and on the same day of such posting by depositing a true copy of same in the United States Mail, First Class in an envelope properly addressed to the defendant(s) at the address shown in said summons, with adequate postage affixed thereon containing notice to the defendant(s) to answer said summons at the place stated in the summons.

NON EST

Diligent search made and defendant _____ not to be found in the jurisdiction of this Court.

This 23 day of June 20 03

Cecil Young
DEPUTY

SHERIFF DOCKET 4 PAGE 107

SUPERIOR
 IN THE SUPERIOR/STATE COURT OF TOWNS COUNTY COUNTY
 STATE OF GEORGIA

Ford Motor Credit Company
P.O. Box 6508
Mesa, AZ 85216

PLAINTIFF

VS.

Anthony J. Smith

DEFENDANT

CIVIL ACTION
 NUMBER 03-00-13508

This is to certify that this
 is a true & correct copy
 made from the original
 this 7 day of May
2013
Cecil Dye
 Clerk Superior Court

SUMMONS

TO THE ABOVE NAMED DEFENDANT:

You are hereby summoned and required to file with the Clerk of said court and serve upon the Plaintiff's attorney, whose name and address is:

MacDowell & Associates, Ltd.

an answer to the complaint which is herewith served upon you, within 30 days after service of this summons upon you, exclusive of the day of service. If you fail to do so, judgment by default will be taken against you for the relief demanded in the complaint.

This 10 day of June, 2013

Clerk of Superior/State Court

BY Cecil Dye

Deputy Clerk

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

Ford Motor Credit Company
Plaintiff,

CASE NO.: 03-CV-1350B

v.

Anthony J. Smith
Defendant.

Towns County, Georgia
Entered
6-10-03
Cecil Dye
Clerk Superior Court

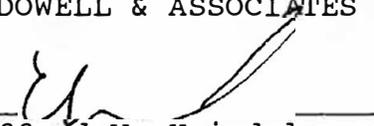
COMPLAINT ON A CONTRACT

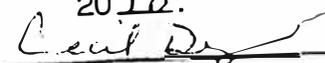
COMES NOW, the Plaintiff in the above stated action and shows the Court the following:

1. The Defendant is a resident of said state and county and subject to the jurisdiction of this Court.
2. The Defendant is indebted to the Plaintiff in the principal sum of \$ 12237.52 as a balance due under the terms of a contract between the parties dated May 6, 2000, which contract is presently in default.
3. Demand has been made upon said Defendant for the balance due. Despite said demand the Defendant has failed and refused to pay.
4. The Defendant is hereby notified that Plaintiff seeks to enforce the attorney's fees provision contained in the contract. If the Defendant pays the full principal and interest sums demanded within ten (10) days from the date of service of this Complaint upon said Defendant, no attorney's fees will be claimed. If the full principal and interest sums demanded are not paid within ten (10) days after service of this Complaint, then attorney's fees pursuant to O.C.G.A. Section 13-1-11 (a)(2) will be charged.

WHEREFORE, Plaintiff demands judgment against the Defendant for the sum of \$12237.52 principal, \$1196.93 interest, plus additional accruing interest at the rate of 7.00% up until the date of judgment, \$1248.75 attorney's fees and all costs of Court.

MacDOWELL & ASSOCIATES LTD.

BY: 
Clifford W. Heindel
Attorney for Plaintiff
Georgia Bar Number: 343560
024042 / 39049

This is to certify that this
is a true & correct copy
made from the original
this 7 day of May
2018.

Clerk Superior Court

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

Ford Motor Credit Company
Plaintiff,

CASE NO.:
03-CV-135DB

v.

Anthony J. Smith
Defendant.

TOWNS COUNTY CLERK
Entered
8-21-03
Court Date
Case Number

JUDGMENT BY DEFAULT

It appearing to the Court that the Defendant,
Anthony J. Smith, has been properly served with
process in this action and has failed to file an
Answer or other defensive pleadings within the time
allowed by law;

IT IS THEREFORE ORDERED AND ADJUDGED
that the Plaintiff recover of the Defendant,
Anthony J. Smith, as follows:

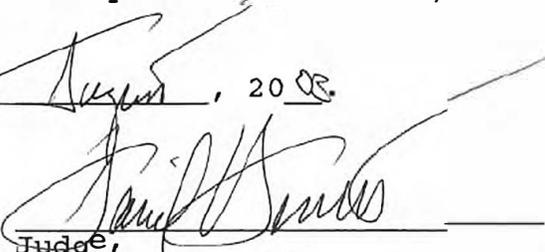
Principal	\$ 12,237.52
Interest	\$ 1,361.21
Attorney's Fees	\$ 1,248.75

All Costs of Court

The Defendant was in default on the contract
as of January 9, 2002. Interest accrued from
January 9, 2002 at the rate of 7% per annum.

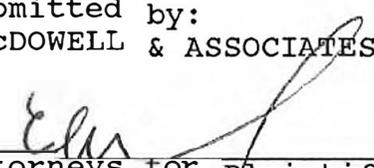
IT IS FURTHER ORDERED that interest shall accrue from
the date hereof on the principal sum of \$ 12,237.52 at
the rate of 12% per annum, as provided by O.C.G.A. 7-4-12,
until paid.

SO ORDERED this 18 day of August, 2003.



Judge,
TOWNS COUNTY
SUPERIOR COURT

Submitted by:
MacDOWELL & ASSOCIATES



Attorneys for Plaintiff
Clifford W. Heindel
Ga. Bar Number: 242560
024042 / 39049

MacDOWELL &
ASSOCIATES
LIMITED

ATTORNEYS AT LAW

IN THE SUPERIOR COURT OF TOWNS COUNTY
STATE OF GEORGIA

Ford Motor Credit Company
Plaintiff,

CASE NO.:
03-CV-135DB

v.

Anthony J. Smith
Defendant.

CERTIFICATE OF ATTORNEY AS TO DEFAULT

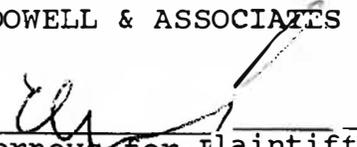
This is to certify that the above-styled Complaint was filed for record June 10, 2003. The Defendant, Anthony J. Smith, was served personally on June 23, 2003.

No Answer or defensive pleading having been filed, the same is now in default.

The Complaint seeks only liquidated damages.

Executed on August 13, 2003 at Atlanta, GA.

MacDOWELL & ASSOCIATES



Attorneys for Plaintiff
Clifford W. Heindel
Ga. Bar Number: 343560
024042 / 39049

MacDOWELL &
ASSOCIATES
LIMITED

ATTORNEYS AT LAW

MacDOWELL & ASSOCIATES

LIMITED

ATTORNEYS AT LAW

C. FREDERICK MacDOWELL *
CLIFFORD W. HEINDEL *
TODD A. MacDOWELL *
HARVEY L. WACHSMAN (AL)
DONNIE C. HUGHES (AL)
DAVID CHEN (CA)

*ALSO ADMITTED IN CALIF.

August 13, 2003

8-21-03

CLERK, TOWNS COUNTY SUPERIOR COURT
48 River Street, Suite E

HIAWASSEE, GA 30546

RE: Case No.: 03-CV-135DB
Ford Motor Credit Company v.
Anthony J. Smith
Our File No.: 024042 / 39049

Dear Clerk:

Please have the Judge sign the enclosed Default Judgment (if it is yet to be signed). We would appreciate your returning the extra copy of the Order, once filed in your office.

In addition, please issue a FIFA and have it recorded on the G.E.D. After the FIFA has been issued, please forward it to this office in the envelope provided.

Any additional court costs due in this case will be paid promptly upon receipt of your bill.

Thank you for your cooperation.

Sincerely,

MacDowell & Associates

MAA/tm

enclosures

WRIT OF FIERI FACIAS

IN THE SUPERIOR COURT OF Towns COUNTY, GEORGIA

CIVIL ACTION NUMBER 03-CV-135DB
8-18-2003

Ford Motor Credit Company

JUDGMENT DATE _____

Plaintiff's Attorney - Name, Address & Telephone

Plaintiff(s)

VS.

Name: Clifford W. Heindel

Anthony J. Smith

Address: _____

Defendant(s)

Telephone & Area Code: _____

Fi. Fa. in Hands of: Clifford W. Heindel

To all and singular the sheriffs of the State and their lawful deputies:

In the above styled case, and on the judgment date set out, the plaintiff(s) named above recovered against the defendant(s) named above, judgment in the following sums:

Principal	\$ <u>12,237.52</u>
Interest	\$ <u>1,361.21</u>
Interest - Other	\$ <u>12%</u>
Attorney's Fees	\$ <u>1,248.75</u>
Court Costs	\$ <u>99.50</u>
Total	\$ <u>14,946.98</u>

CANCELLATION

The within and foregoing Fi. Fa. having been paid in full the Clerk of Superior Court is hereby directed to cancel it of record this _____ day of _____ 19_____.

Signature: _____

Title: _____

NOTE: _____

with future interest upon said principal amount from the date of judgment at the legal rate.

Therefore, YOU ARE COMMANDED, that of the goods and chattels, lands and tenements of said defendant(s), and ESPECIALLY/ONLY of the following described property, to wit:

YOU cause to be made the several sums set out in the foregoing recital of the judgment in this case and have the said several sums of money before the Magistrate Court of this County at the next term of court, with this Writ to render to said plaintiff(s) the principal, interest, attorney fees and costs aforesaid.

Witness the Honorable David E. Barrett Judge of Said Court, this the

21 day of August 2003

CLERK

By: Cecil Orr
Deputy Clerk

Entered on General Execution Docket 3 at Page 15 this 21 day of August, 2003.

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PROOF OF SERVICE

STATE OF CALIFORNIA, COUNTY OF SAN FRANCISCO

At the time of service, I was over 18 years of age and not a party to this action. I am employed in the County of San Francisco, State of California. My business address is 425 Market Street, 26th Floor, San Francisco, CA 94105.

On September 19, 2018, I served true copies of the following document(s) described as on the interested parties in this action as follows:

SEE ATTACHED SERVICE LIST

BY MAIL: I enclosed the document(s) in a sealed envelope or package addressed to the persons at the addresses listed in the Service List and placed the envelope for collection and mailing, following our ordinary business practices. I am readily familiar with Hanson Bridgett LLP's practice for collecting and processing correspondence for mailing. On the same day that correspondence is placed for collection and mailing, it is deposited in the ordinary course of business with the United States Postal Service, in a sealed envelope with postage fully prepaid.

BY E-MAIL OR ELECTRONIC TRANSMISSION: I caused a copy of the document(s) to be sent from e-mail address cjensen@hansobridgett.com to the persons at the e-mail addresses listed in the Service List. I did not receive, within a reasonable time after the transmission, any electronic message or other indication that the transmission was unsuccessful.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Executed on September 19, 2018, at San Francisco, California.



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SERVICE LIST

United States Nuclear Regulatory Commission
Petition Review Board
Washington, D.C. 20555-0111

James Smith
United States Nuclear Regulatory Commission
Office of Nuclear Material Safety and Safeguards
Division of Decommissioning, Uranium Recovery, and Waste Programs
Materials Decommissioning Branch
Washington, D.C. 20555-0111
James.Smith@nrc.gov

Lorraine Baer, Esq.
United States Nuclear Regulatory Commission
Office of General Counsel
Washington, DC 20555-0111
Lorraine.Baer@nrc.gov

Steve Castleman, SBN 97564
Environmental Law and Justice Clinic
Golden Gate University School of Law
536 Mission Street
San Francisco, California 94105-2968
scastleman@ggu.edu

David C. Anton, SBN 94852
1717 Redwood Ln
Davis, CA 95616
davidantonlaw@gmail.com